Western Cape Government
Environmental Affairs and Development Planning

FORM NO. BAR10/2019

BASIC ASSESSMENT REPORT

THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) AND THE ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS.

NOVEMBER 2019

(For official use only)	
Pre-application Reference Number (if applicable):	**16/3/3/6/7/1/D1/9/0093/22**
EIA Application Reference Number:	
NEAS Reference Number:	
Exemption Reference Number (if applicable):	
Date BAR received by Department:	
Date BAR received by Directorate:	
Date BAR received by Case Officer:	

GENERAL PROJECT DESCRIPTION

(This must Include an overview of the project including the Farm name/Portion/Erf number)

PROPOSED UPGRADES TO THE BULK WATER INFRASTRUCTURE, KURLAND, BITOU LOCAL MUNICIPALITY.

Sharples Environmental Services was appointed by Niel Lyners and Associates (RS) Pty Ltd, on behalf of the Bitou Local Municipality to undertake the environmental assessment, in accordance with the National Environmental Management Act, 1998 (Act 107 of 1998), in terms of the Environmental Impact Assessment Regulations, 2014 (as amended 2017), for the Proposed Upgrade to the Bulk Water Infrastructure, Kurland, Bitou Local Municipality.

The proposed development is an initiative of the Bitou Local Municipality and will allow for the increase in capacity and improvement on bulk services, that will not only benefit the current Kurland population, but will accommodate for future development opportunities, such as the proposed Kurland Housing Development on ERF 562, Kurland, which will take significant steps toward addressing the housing backlog within the municipality. The proposed upgrades will entail:

Rising Main, Pump Stations and Reservoirs

As depicted in Annexure D, drawing C20028G (sheets 1 – 19), as per the Engineering Report Appendix L of the Draft BAR.

- Construction of a new 35l/s water pump station at the existing Matjiesfontein Reservoir, within the existing servitude.

- Construction of a new 200mm uPVC bulk water pipeline, outside of the N2 road reserve, 6m within the 60m building line, from Matjiesfontein Reservoir, situated on the South side of the N2.

    - Approximate length from existing Matjiesfontein Reservoir is approximately 3.08 Km's, to tie into the new proposed Matjiesfontein Upper pump station.

    - Approximate length from the new proposed Upper Matjiesfontein pump station is 6.1Km's, to tie into an existing 3Km long, 160mm UPVC pipeline along the N2 which comes down from the Kurland Water Treatment Works.

    - The existing 160 mm diameter rising main will feed water through a new 2 050m long uPVC, 200mm diameter rising main to the Kurland Reservoir which will be laid adjacent (parallel offset to stay outside future SANRAL road reserve) to the 200mm diameter old AC pipeline (which will be abandoned in place) currently supplying Kurland as shown on the drawings included under Annexure D (of the Engineering Report (Appendix L)).

- Construction of a new 22l/s water pump station and a 0.6ML Reservoir, to be known as the Upper Matjiesfontein Reservoir.

Supply Pipelines

As depicted in drawing C20028G – 16 (sheet 16 -19 of 19), as per the Engineering Report Appendix L.

- Construction of a new 2 560 m long 315 mm diameter uPVC pipeline, from Kurland Reservoir toward Kurland Town, adjacent (parallel offset to stay outside future SANRAL Road Reserve) to the old 200mm diameter pipeline (which will be abandoned in place), as shown on the drawings included in Annexure D (of the Engineering Report, Appendix L).
- The 315 mm diameter uPVC pipeline will be connected to a new 330 m long 200mm diameter supply pipeline feeding the Kurland Township, which will follow the alignment of the existing Kurland Township supply pipeline. This 330 m long section will just replace the existing 200 mm diameter AC pipeline which is considered old, is deteriorated and will be requiring regular repairs.

- The 315 mm diameter uPVC pipeline will also be connected to a new 1200 m long 200 mm diameter uPVC supply pipeline which will be laid from the 315 mm diameter supply pipeline to the development on Erf 562.

Kurland Water Treatment Works

- Upgrade at the existing Kurland Water Treatment Works, including the construction of a 1.5ML Reservoir, and additional mechanical and electrical works, contained within the existing servitude (therefore, not a listed Activity in terms of the EIA Regulations, 2014(as amended 2017).

- Establishment of new boreholes, adjacent to the Water Treatment Works site (not a listed Activity in terms of the EIA Regulations, 2014(as amended 2017).

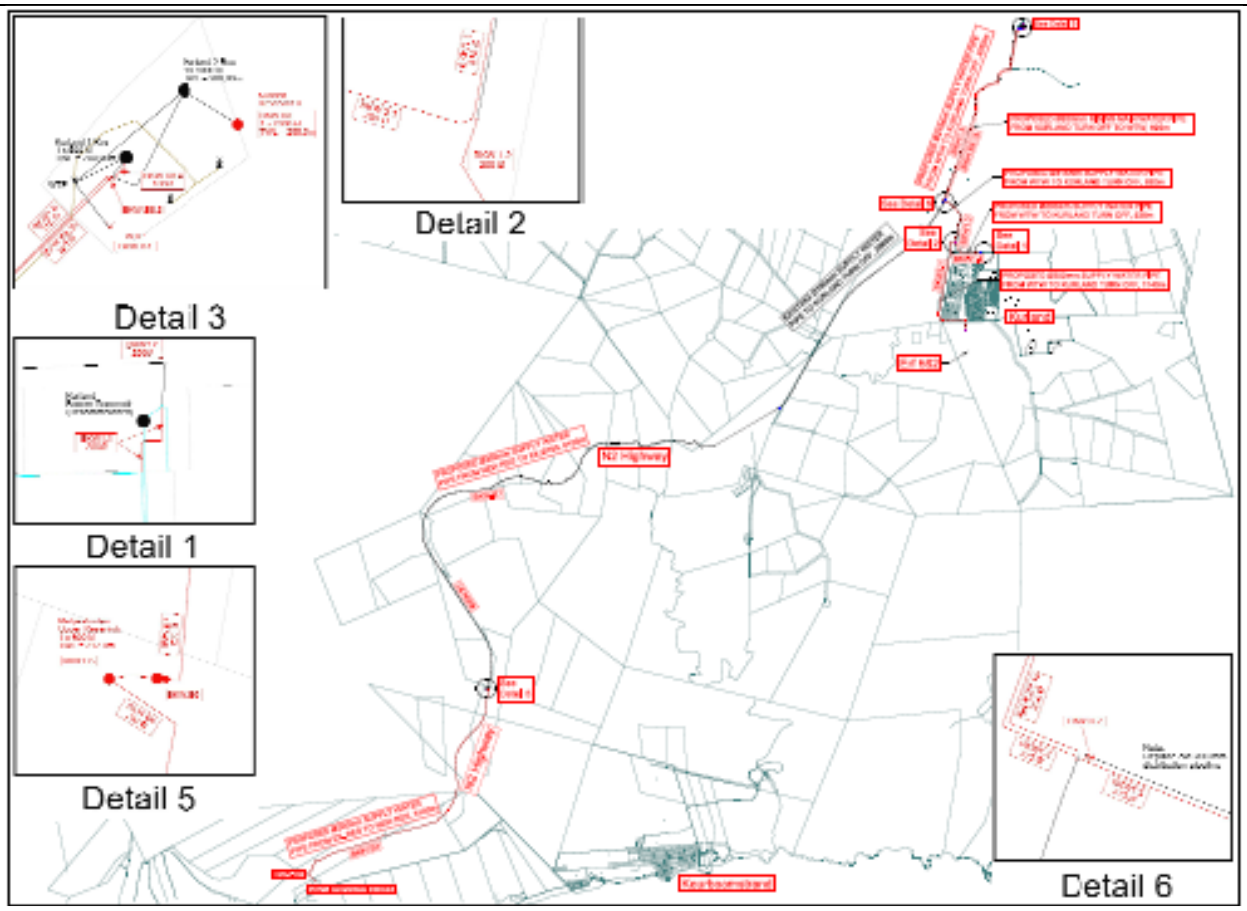


Figure 1: Schematic layout of Proposed Bulk Services (Annexure A of the Engineering report).

According to the Engineering Report (Appendix L), the proposed planned pipelines will have to be constructed within private property that falls within the 5m DRE building line (Road Ordinance 19 of 1976) and larger 30m Municipal building line and 60m SANRAL building line, measured from the road reserve fence. Once the final route of the proposed pipelines has been approved a land surveyor can commence the legal process of registering a services servitude to allow access to Bitou Municipality to operate and maintain the services. No compensation will be applicable to landowners due to the proposed servitude being inside the above-mentioned building lines. This, however, will need to be confirmed by the legal department of the Municipality. The extent of the servitude would be in the order of 5m wide.

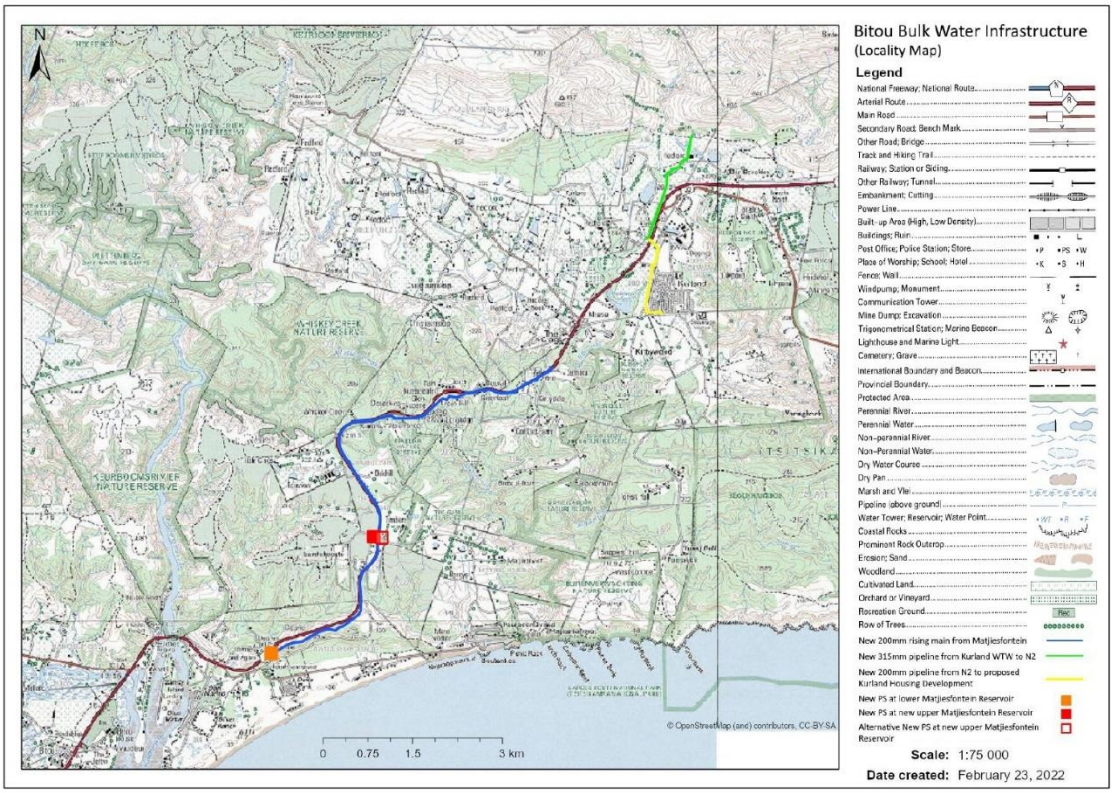


Figure 2: Locality Map

Figure 3: Proposed New Pump Station at Matjiesfontein Reservoir (orange) and Preferred Proposed 200mm Rising Main (green).

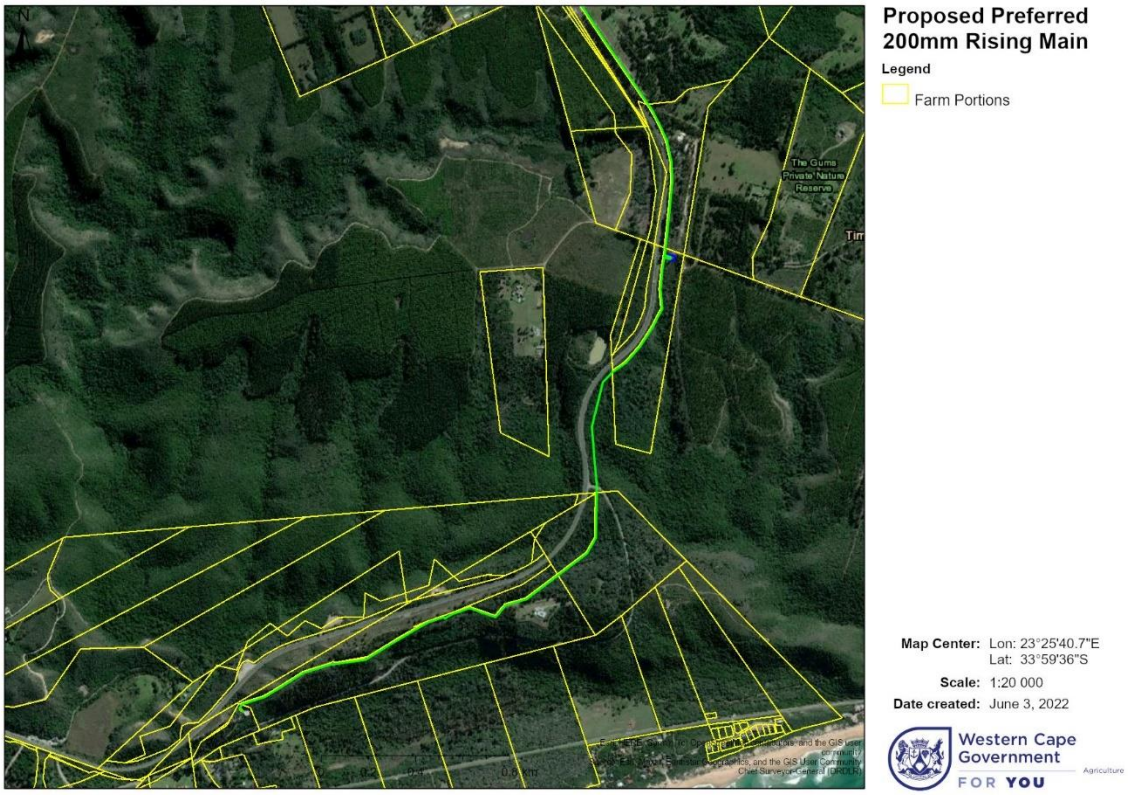


Figure 4: Preferred Proposed 200mm Rising Main (green) from Matjiesfontein Reservoir to the Proposed New Matjiesfontein Upper Reservoir and Pump Station.

Figure 5: Preferred Proposed New Matjiesfontein Reservoir and Pump Station (blue) with the Preferred Proposed 200mm Rising Main (green).

Figure 6: Preferred Proposed 200mm Rising Main (green) from Proposed New Matjiesfontein Upper Reservoir and Pump Station to existing 160mm tie-in.

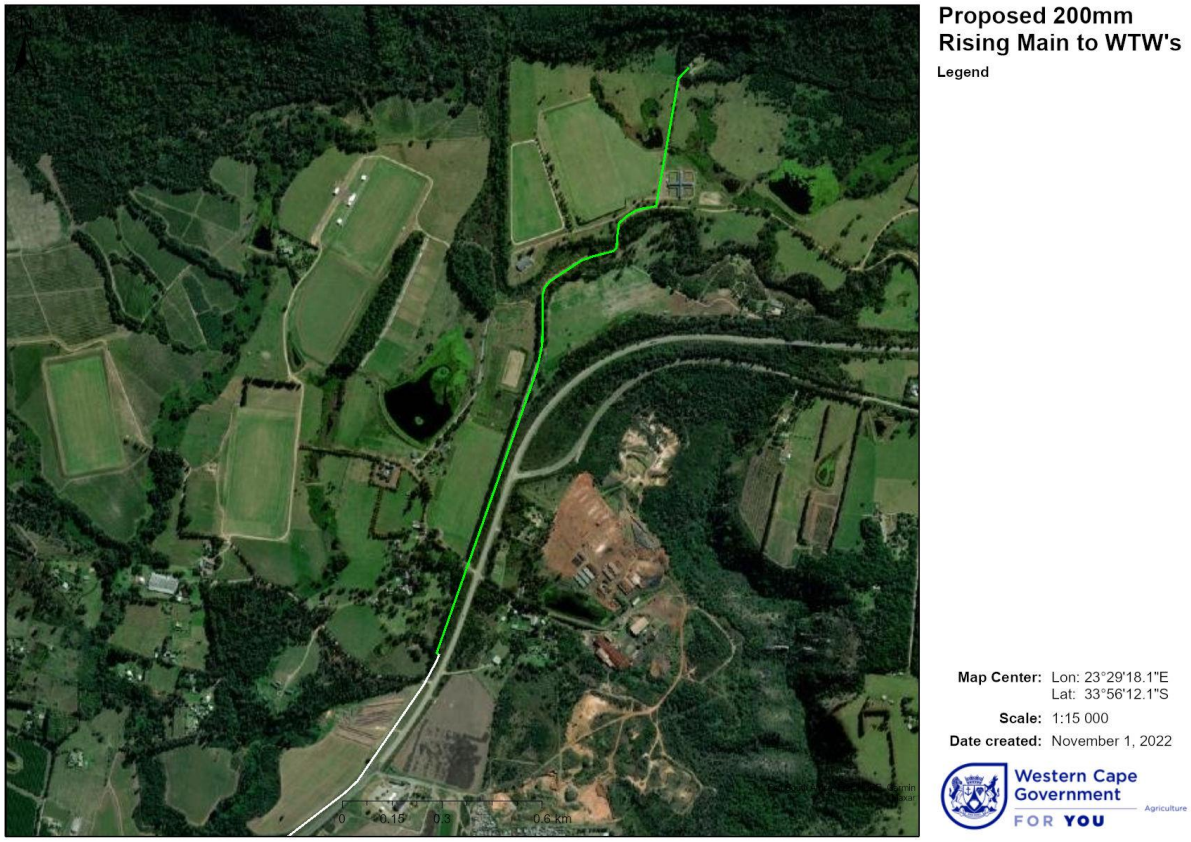


Figure 7: Proposed 200mm Rising Main from existing 160mm pipeline (white polyline) to the Kurland WTW's.

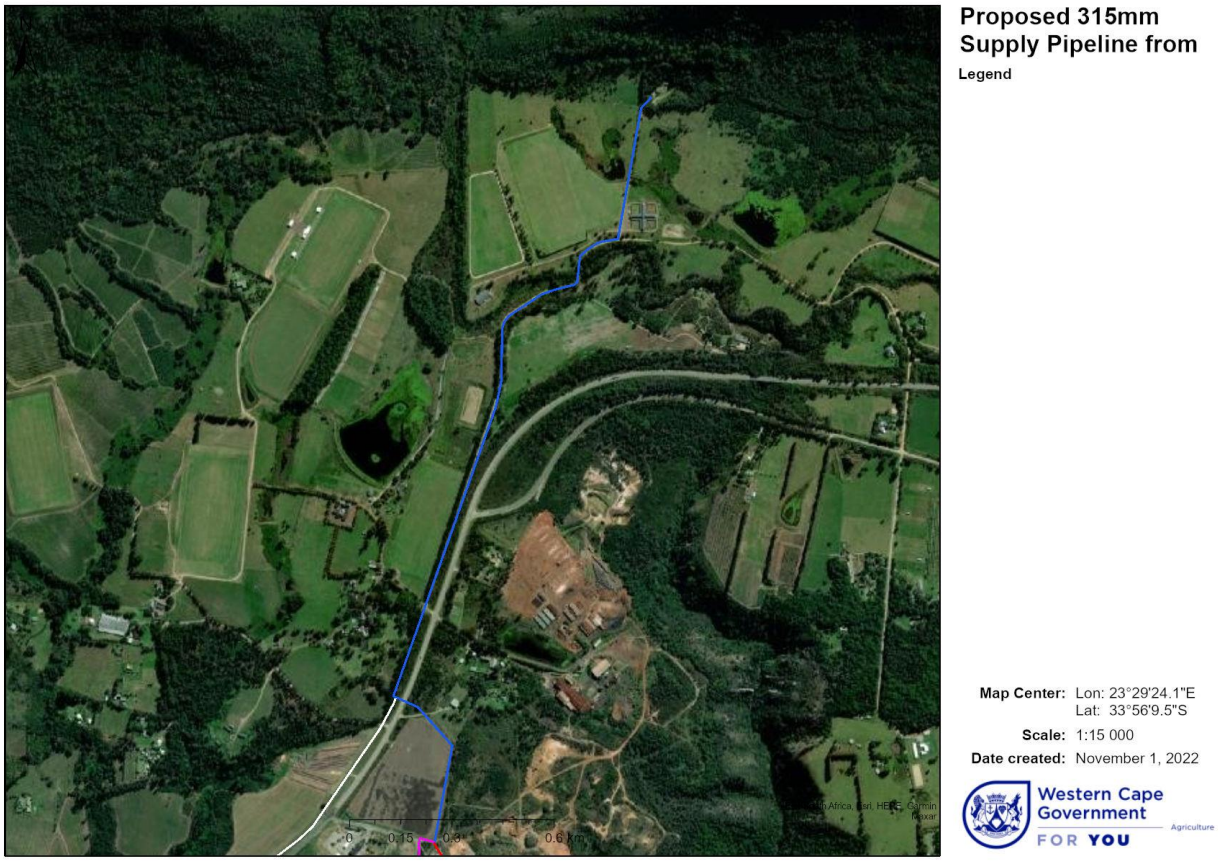


Figure 8: Proposed 315mm UPVC Supply Pipeline (Blue) from Kurland WTW's to Kurland.

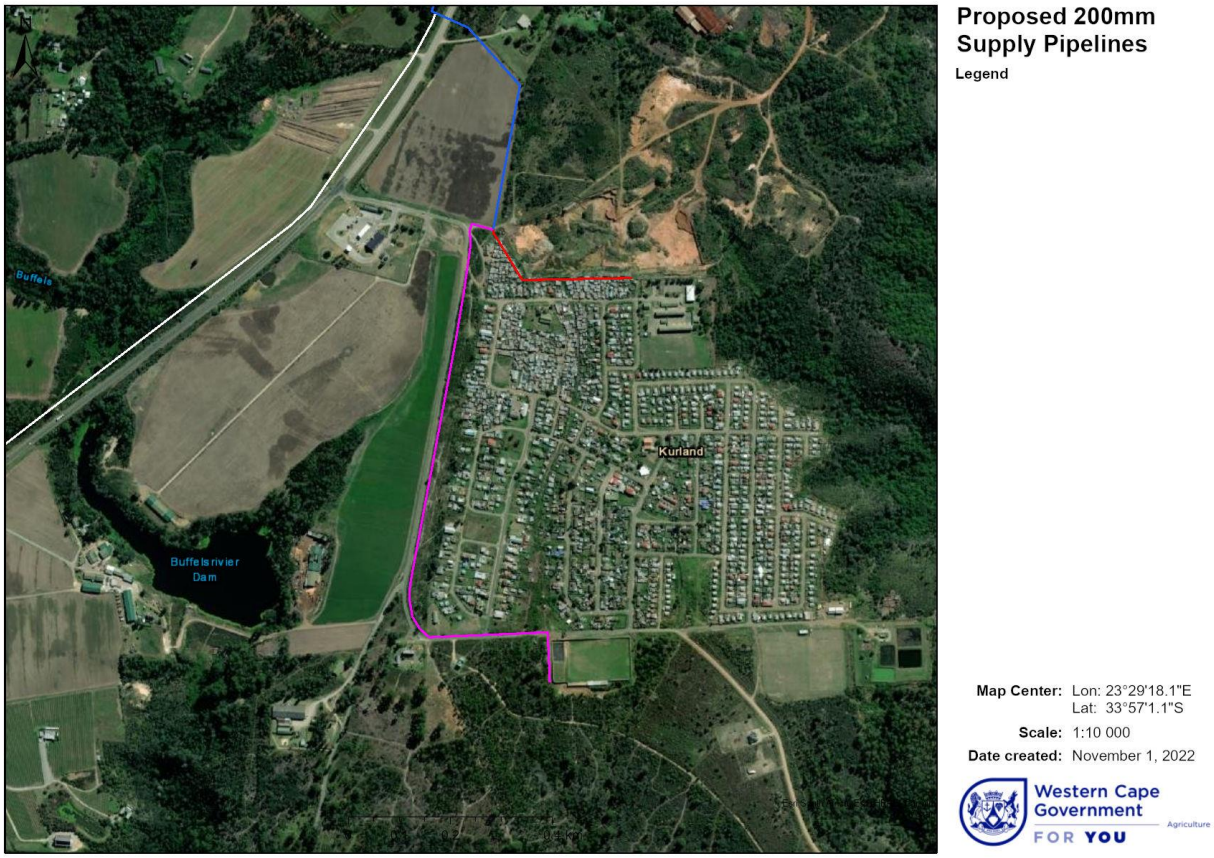


Figure 9: The 315mm uPVC splits into a proposed 200mm UPVC Supply Pipeline to Kurland Housing 562 (pink polyline) and 200mm UPVC Supply Pipeline to Kurland Township (red polyline).

Engineering Input:

Current:

Raw Water Supply: The main raw water supply to the Kurland area is from the Wit River abstraction
point. Water is pumped from a pump station at the Wit River abstraction point via a 700 m long 150 mm diameter rising main to the water treatment works. The capacity of the scheme is 600 Kl/day. The abstraction from the Wit River is not exceptionally reliable since the delivery of 600 kl/day reduces drastically during dry periods. Back-up sources are therefore important to provide sustainable supply.

There are two boreholes on the site of the Kurland water treatment works (WTW). GWA-KUR 1 with an inside diameter of 127 mm and casing installed to 150 m depth has been abandoned due to excessive iron content and clogging of the pipework. GWA-KUR 2 with an inside diameter of 146 mm and casing installed to 76 m depth has an optimum yield of 5 l/s (432kl/day).

Two (2) new boreholes Kur-3 and Kur-4 has been drilled within the WTW yard and are being equipped by Bitou Municipality. According to the report by Groundwater Africa attached under Annexure C2 the four (4) boreholes should supply a sustainable yield of 8 L/s (961 Kℓ/d). In order to maintain a conservative approach towards water security the 5 L/s (432 Kℓ/d) shall be used as yield from the groundwater source.

In order to provide a reliable and sustainable bulk supply to Kurland a 3 km long 160 mm diameter
uPVC pipeline has been laid in the past all along the N2 highway between the Kurland Reservoir and the Keurboom Strand Reservoir. This was done as Phase 1 of the proposed scheme to convey treated water from Keurboom Strand Reservoir to Kurland Reservoirs and a further approximately 9 km of 200mm rising main will now be laid all along the N2 to complete the scheme.

Water Treatment: The raw water is treated at the Kurland WTW, with a capacity of 600 Kl/day and currently being upgraded to 1.2ML/day, the following processes exist at the WTW: Coagulation, flocculation, horizontal settlement, pressure filtration, gravity sand filtration, chlorination and PH correction.

Water Distribution: From the Kurland reservoirs treated water is fed via an existing 3.2 km long 200 mm diameter gravity supply pipeline to the Kurland Township. The potable water reticulation system consists of a total of 4,95 km of pipework ranging from 50 mm to 160 mm in diameter. Some reinforcement of pipes and inter-connection pipes will be necessary in future to improve the network conveyance.

Proposed Scope of Water Supply Scheme

Raw Water Source:

The additional source capacity required in 2033 is 1 198.5 Kℓ/d (13,9 ℓ/s). A 3 km long 160 mm diameter uPVC pipeline was laid in the past from Kurland along the N2 Road towards Keurboom Strand. This was done as a first phase of a scheme to pump treated water from Keurboomstrand Reservoir (1 Mℓ) or Matjiesfontein Reservoir (3 Mℓ) to Kurland Reservoir. An additional length of about 9 km of 200 mm diameter pipeline as well as a pump station will be needed to complete the scheme. Although the source capacity was calculated for a 10-year period, pipelines are designed for a 20-year period and hence the required capacity in 2043 will be:

1,5 x 1,1 x 1 775.8 = 2 930.1 Kℓ/d

Minus: Witrivier abstraction = 600.0 Kℓ/d

Boreholes in WTW Yard = 432.0 Kℓ/d

Total = 1 898.1 Kℓ/d ~ 22.0 ℓ/s

The Matjiesfontein Reservoir (3 Mℓ) has a bigger capacity than the Keurboomsrivier Reservoir (1 Mℓ) and is situated next to the N2 Road and it is easier accessible. It is therefore suggested that the water is pumped from Matjiesfontein Reservoir rather than from the Keurboomstrand Reservoir. The full water level (FWL) of Matjiesfontein Reservoir is 55 MSL and the FWL of Kurland Reservoir is 288 MSL. GLS included this scheme in the Water Master Plan for Bitou Municipality and it entails the following:

- A new pump station at the Matjiesfontein Reservoir with a delivery of 35 ℓ/s at 185 m head will pump through a 3 080 m long 200 mm diameter uPVC rising main to a new 600 Kℓ reservoir (Matjiesfontein Upper Reservoir) next to the N2 Road. The pump station and reservoir will supply Kurland as well as the future Keurbooms area. At the new 600 Kℓ Matjiesfontein Upper reservoir a new pump station delivering 22 ℓ/s at 195 m head will supply the Kurland Reservoirs through a new 6 100 m long 200 mm diameter uPVC rising main. The new 200 mm diameter rising main will be connected to the existing 3 km long 160 mm diameter uPVC rising main which follows a route along the N2 Road up to the N2 pipeline crossing. At this point the existing 160 mm diameter rising main will feed water through a new 2 050m long uPVC 200mm diameter rising main to the Kurland Reservoir which will be laid adjacent (parallel offset to stay outside future SANRAL road reserve) to the 200mm diameter old AC pipeline (which will be abandoned in place) currently supplying Kurland as shown on the drawings included under Annexure D (of the Engineering Report, Appendix L).

Water Treatment Works (WTW):

The additional WTW capacity required in 2033 is 2 230.5 Kℓ/d. The additional water which will be pumped from Matjiesfontein Reservoir is treated water and will not have to be treated again. The only additional treatment capacity required will therefore be for the borehole water which amounts to 432 Kℓ/d (5 ℓ/s).

Limited space is available on site between the existing structures of the WTW. It is therefore envisaged that the existing WTW be upgraded with an additional capacity of 500 Kℓ/d. The upgraded WTW will handle the same processes as the existing, namely coagulation, flocculation, settlement, filtration, chlorination and PH correction. Bitou Municipality is currently in the process of upgrading the WTW Civil Engineering structures with DWS funding made available via the WSIG program. As a Phase 1.1, a motivation was also prepared by the Municipality to apply for extra funding from WSIG to install new Mechanical & Electrical Engineering equipment for the newly upgraded WTW as a Phase 1.2 (Annexure F3). A conceptual technical memo and subsequent detail design report detailing the water treatment upgrade is included in Annexure F1 and Annexure F2 respectively (as per the Engineering Report, Appendix L).

Interim Water Sources

Groundwater Africa was appointed by Neil Lyners and Associates (RF) (Pty) Ltd to investigate groundwater as a water source option to augment supplies to Kurland Village for the Bitou Municipality. An initial target of 5 – 10 L/s is required for the first phase of a proposed housing

development. The target will be reached with the current equipping of the four (4) boreholes within the WTW yard. Should ~25 L/s be available from groundwater sources then it may not be necessary to install a pipeline from the Matjiesfontein Reservoir the third phase of the Erf 562 development.

Kurland is located on the widely used Table Mountain Group (TMG) aquifer system, and there is a slight possibility of obtaining the targeted 25 L/s within a ~5 km radius of the Village's Water Treatment Works (WTW). Several boreholes would be required, and in some areas, it may be necessary to treat for iron and manganese.

Due to the fact that these borehole sites are located on private properties and the water will need extensive treatment the potential of additional groundwater is not seen as a viable immediate option to augment the future water supply. Potential drill sites and further detail regarding the ground water exploration is included under Annexure C1 & Annexure C2. These sites will be included in the EIA process though.

Reservoir:

The additional reservoir capacity required in 2033 is 1 203.6 Kℓ- See 2.2. A reservoir with a capacity of 1 203.6 Kℓ is not a standard size, and it is therefore envisaged that a reservoir with a capacity of 1 500 Kℓ (1.5 Mℓ) is constructed which will be adequate until 2038. The new 1.5 Mℓ reservoir will be constructed directly adjacent to the existing 1 Mℓ and 0,5 Mℓ reservoirs. A total reservoir capacity of 2.7 Mℓ will be available which will satisfy the storage requirement until 2038.

Supply Pipeline to Kurland:

The additional capacity required for the supply pipeline to Kurland is 52.2 ℓ/s - See 2.2.

The Water Master Plan Ad hoc report for Kurland done by GLS (Annexure E of the Engineering Report) made provision for the following supply pipelines from the anticipated Kurland Reservoir to Kurland Township:

- From Kurland Reservoir a new 2 560 m long 315 mm diameter uPVC pipeline will be laid adjacent (parallel offset to stay outside future SANRAL Road Reserve) to the old 200mm diameter pipeline (which will be abandoned in place), as shown on the drawings included in Annexure D. Where the 315 mm diameter uPVC pipeline stops, it will be connected to a new 330 m long 200mm diameter supply pipeline feeding the Kurland Township, which will follow the alignment of the existing Kurland Township supply pipeline. This 330 m long section will just replace the existing 200 mm diameter AC pipeline which is considered old, is deteriorated and will be requiring regular repairs.

  The 315 mm diameter uPVC pipeline will also be connected to a new 1200 m long 200 mm diameter uPVC supply pipeline which will be laid from the 315 mm diameter supply pipeline to the development on Erf 562.

Recommendations:

It is recommended that the scheme be developed in phases as follows (GLS Master Planning references shown in brackets):

Phase 1: Water Treatment Works (Additional 200 Units)

- *Phase 1.1* (ALREADY FUNDED BY WSIG):

- The water treatment works civil structures upgraded with an additional capacity of 500 Kℓ/day

(BKW.B1)

- A new 32 m long 200mm diameter uPVC Class 12 distribution pipe (BKW1.1)

- *Phase 1.2:*

Mechanical and electrical works associated with water treatment works as per design report & motivation included under Annexure F2 and Annexure F3 (BKW.B1)

Phase 2: Bulk Pipeline Connecting to Erf562 from Existing network (Additional 250 Units)

- A 1 200 m long 200 mm diameter uPVC Class 12 supply pipeline be installed from existing network to Erf 562.

Phase 3: Supply Scheme from Matjiesfontein Reservoir (Additional 1630 Units)

Phase 3.1:

- A 35 ℓ/s at 185 m head pump station be constructed at Matjiesfontein Reservoir.
- A 3 080 m long 200 mm diameter uPVC Class 16 Rising Main be installed from Matjiesfontein Reservoir all along the N2 Road to a new 600 Kℓ Matjiesfontein Upper Reservoir.
- A new 600 Kℓ Matjiesfontein Upper reservoir be constructed next to the N2 Road.

Phase 3.2:

- A 22 ℓ/s at 195 head pump station be constructed at the 500 Kℓ Matjiesfontein Upper Reservoir
- A 6 100 m long 200 mm diameter uPVC Class 16 rising main be laid from the 600 Kℓ Matjiesfontein Upper Reservoir to the existing 160 mm diameter rising main (BKW.B7)
- A 2 050 m long 200 mm diameter uPVC Class 10 rising main be laid from the other end of the existing 160 mm diameter rising main to the Kurland Reservoir (BKW.B8.1b).

Phase 3.3:

- A new 1,5 Mℓ reinforced concrete Reservoir be constructed next to the existing two reservoirs.
- A 2 560 m long 315 mm diameter uPVC Class 12 supply pipeline be installed from the Kurland Reservoir towards Kurland Township (BKW1.3)
- A 330 m long 200 mm diameter uPVC Class 12 supply pipeline from where the 315 mm diameter supply pipeline stops to the Kurland Township close to the Kurland Bottom Reservoir (BKW1.2).

Environmental Legislation

According to the National Environmental Management Act, 1998 (Act 107 of 1998), Environmental Impact Assessment Regulations, 2014 (as amended 07th April 2017), Listing Notice 1 and 3 of 2014, published under Government Notice No. 983 and 985, the following

activities are applicable:

Activity No(s):	Provide the relevant **Basic Assessment Activity(ies)** as set out in **Listing Notice 1**	Describe the portion of the proposed development to which the applicable listed activity relates.
12	[The development of— (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs— **(a) within a watercourse;** (b) in front of a development setback; or **(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; —** excluding— (aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such development occurs within an urban area; [or] (ee) where such development occurs within existing roads, [or] road reserves or railway line reserves; or (ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.	The proposed activity is applicable. There is potential for 100m^2 of infrastructure to be situated in and within 32ms of a watercourse.
19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or	The proposed activity is applicable. Watercourse crossings will entail the excavations through the existing

	moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from **a watercourse;** but excluding where such infilling, depositing, dredging, excavation, removal or moving— (a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies; (d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or (e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies	watercourses/drainage lines, that will result in at least 10 cubes of soil being infilled, deposited, dredged, excavated, or removed.
Activity No(s):	Provide the relevant **Basic Assessment Activity(ies)** as set out in **Listing Notice 3**	Describe the portion of the proposed development to which the applicable listed activity relates.
2	The development of **reservoirs,** excluding dams, with a capacity of **more than 250 cubic metres.** i. Western Cape i. A protected area identified in terms of NEMPAA, excluding conservancies; ii. **In areas containing indigenous vegetation; or** ~~iii. Inside urban areas:~~ ~~(aa) Areas zoned for use as public open space; or~~ ~~(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, or zoned for a conservation purpose. This listed activity may be triggered, due to areas containing indigenous vegetation.~~	The proposed development will support the construction of a 0.6ML Reservoir, and as confirmed by the Biodiversity Specialist, this area does contain indigenous vegetation. Therefore, this activity is triggered.

12	The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. Western Cape (i) Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; (ii) Within critical biodiversity areas identified in bioregional plans; (iii) Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; (iv) On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning; or (v) On land designated for protection or conservation purposes in an Environmental Management Framework adopted in the prescribed manner, or a Spatial Development Framework adopted by the MEC or Minister.	The proposed activity is applicable, as the proposed pipelines will occur within areas indicated as CBA's.
14	The development of— (ii) infrastructure or structures with a physical footprint of 10 square metres or more;	The proposed activity is applicable, as the proposed pipelines will occur within areas indicated as CBA's.

	where such development occurs— (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour. i. Western Cape i. Outside urban areas: (aa) A protected area identified in terms of NEMPAA, excluding conservancies; (bb) National Protected Area Expansion Strategy Focus areas; (cc) World Heritage Sites; (dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (ee) Sites or areas listed in terms of an international convention; (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (gg) Core areas in biosphere reserves; or (hh) Areas on the estuary side of the development setback line or in an estuarine functional zone where no such setback line has been determined.	

The following is a summary of the development footprint environmental sensitivities identified by the DEA Screening Tool (see Appendix D). Only the highest environmental sensitivity is indicated.

For ease of reference the various screening tools have been designated a letter and categorised on one summary table (Table 2). The designated tools are as follows:

Table 1: Designated Screening Tools

LABEL	*SCREENING TOOL REPORT*
A	Proposed 200mm UPVC Rising Main South of N2 – From Matjiesfontein Reservoir to proposed Matjiesfontein Upper Reservoir and Pump Station.

B	Proposed 200mm UPVC Rising Main South of N2 – From Proposed Matjiesfontein Upper Reservoir and Pump Station to tie-in.
C	Alternative_Proposed 200mm UPVC Rising Main North of N2 – From Matjiesfontein Reservoir to proposed Matjiesfontein Upper Reservoir and Pump Station.
D	Alternative Proposed 200mm UPVC Rising Main North of N2 – From Proposed Matjiesfontein Upper Reservoir and Pump Station to tie-in
E	Preferred and Alternative_Proposed 0.6ML Matjiesfontein Upper Reservoir & 22L/s Pump Station
F	Proposed 315mm UPVC Pipeline to Kurland – Similar to the 200mm Rising Main intended from the existing 160mm to the WTW's
G	Proposed 200mm UPVC Supply Pipeline to Kurland Housing 562
H	Proposed 200mm uPVC Supply Pipeline to Kurland Township

Table 2: Summary of the environmental sensitivities for the proposed sites.

Theme	**Sensitivity**			
	Very High	**High**	**Medium**	**Low**
Agriculture Theme		**A;B;C;D;F; G;H**	**E**	
Animal Species Theme		**A;B;C;D;E;F ;G**	**H**	
Aquatic Biodiversity Theme	**B;D;F;G;H**			**A;C;E**
Archaeological and Cultural Heritage Theme				**A;B;C;D;E;F ;G;H**
Civil Aviation Theme		**A;B;C;D;E;**	**F;G;H**	
Defence Theme				**A;B;C;D;E;F ;G; H**
Palaeontology Theme	**A;B;C;D**	**F;G**		**E; H**
Plant Species Theme			**A;B;C;D;E;F ;G; H**	
Terrestrial Biodiversity Theme	**A;B;C;D;E;F ;G; H**			

The following studies have been undertaken to inform the BAR:

- Agricultural Compliance Statement
- Terrestrial Biodiversity Impact Assessment
- Aquatic Biodiversity Impact Assessment
- Animal Species Assessment
- Plant Species Assessment

Given the vast nature of this development, the proposed pipelines have been split into 1km intervals, as follows:

Proposed Pipeline	**Section Ref#**	**Point ID**	**Distance from previous point on**	**Coordinates**

			proposed line (m)		
Proposed Rising Main (200mm) to the Existing Tie-In	1	RM200_A	0	34° 0'19.16"S	23°25'9.24"E
		RM200_B	1000	34° 0'6.29"S	23°25'42.52"E
	2				
		RM200_C	2000	33°59'48.29"S	23°26'7.60"E
	3				
		RM200_D	3000	33°59'19.16"S	23°26'18.37"E
	4				
		RM200_E	4000	33°58'50.33"S	23°26'11.47"E
	5				
		RM200_F	5000	33°58'22.47"S	23°25'53.47"E
	6				
		RM200_G	6000	33°58'10.08"S	23°26'25.16"E
	7				
		RM200_H	7000	33°58'1.75"S	23°26'59.00"E
	8				
		RM200_I	8000	33°57'56.62"S	23°27'34.18"E
	9				
		RM200_J	9000	33°57'46.60"S	23°28'8.04"E
	10				
		RM200_K	9175	33°57'43.07"S	23°28'11.06"E
Proposed 315mm Pipeline to Kurland	11	315_A	0	33°55'37.95"S	23°29'44.53"E
		315_B	1000	33°56'3.05"S	23°29'27.45"E
	12				
		315_C	2000	33°56'33.81"S	23°29'15.42"E
	13				
		315_D	2543	33°56'48.46"S	23°29'19.77"E
Proposed 200mm Pipeline to Kurland Housing 562		200_A	0		
		200_B	1000	33°57'2.39"S	23°29'15.34"E
	14				
		200_C	1800	33°57'17.08"S	23°29'24.08"E
Proposed 200mm Pipeline to Kurland Township	15	200_TA	329.2	33°56'48.46"S	23°29'19.77"E
		200_TB		33°56'51.53"S	23°29'30.36"E
Proposed Rising Main (200mm) from the Existing Tie-In to the WTW's	16	RM200_L	0	33°55'37.95"S	23°29'44.53"E
		RM200_M	1000	33°56'3.05"S	23°29'27.45"E
	17				
		RM200_N	2000	33°56'33.81"S	23°29'15.42"E
	18				
		RM200_O	2034.9	33°56'34.72"S	23°29'15.35"E

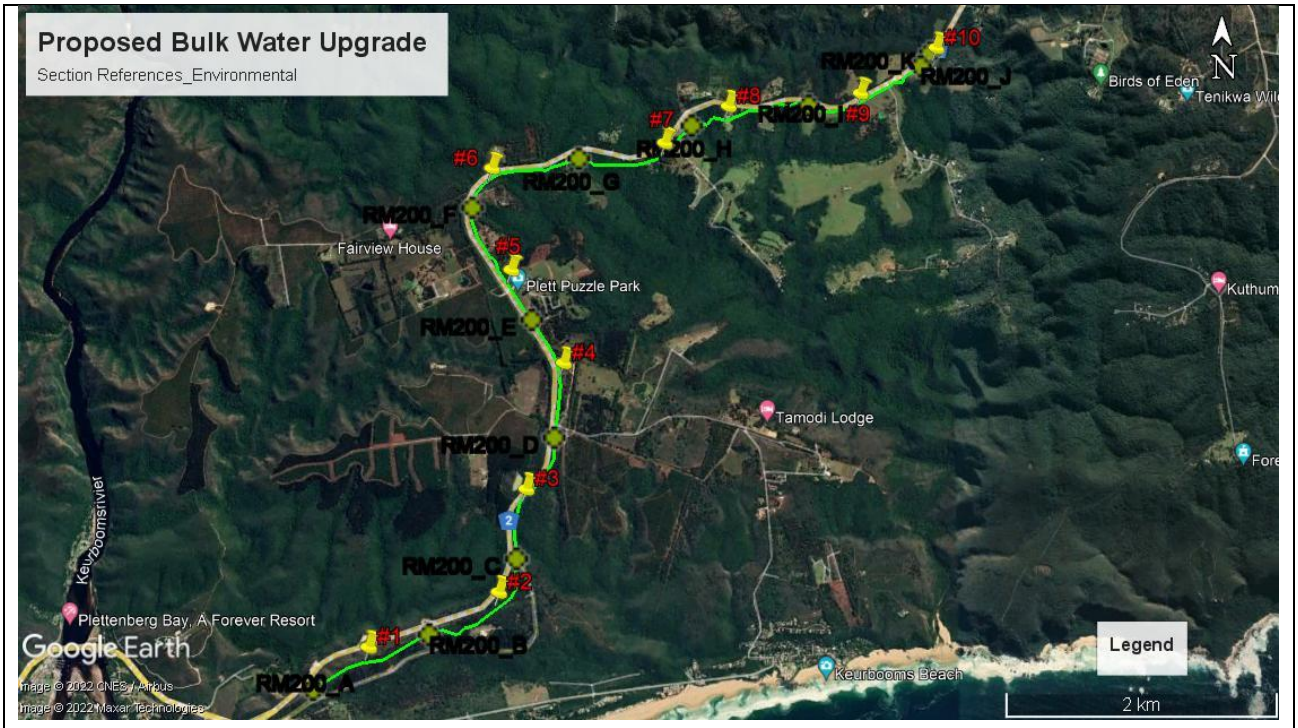


Figure 10: Proposed reference sections – 200mm Rising Main to Existing 160mm Tie-In.

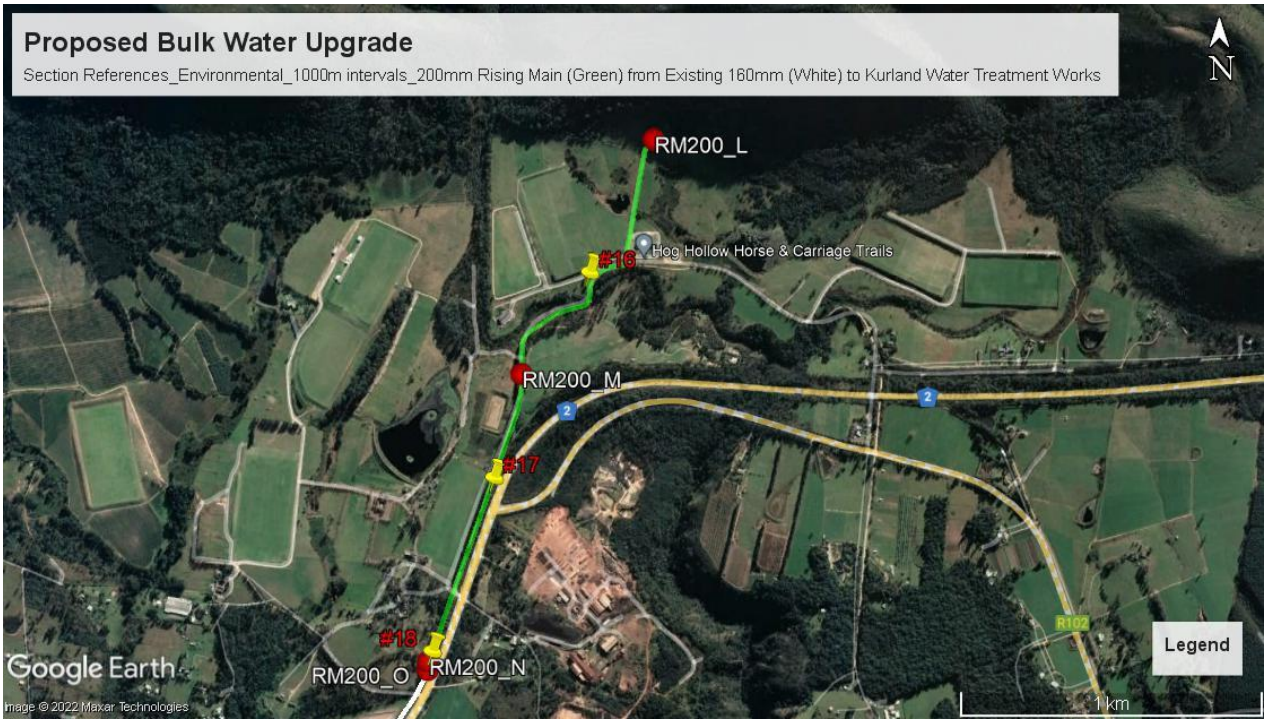


Figure 11: Proposed reference sections – 200mm Rising Main to Kurland WTW's

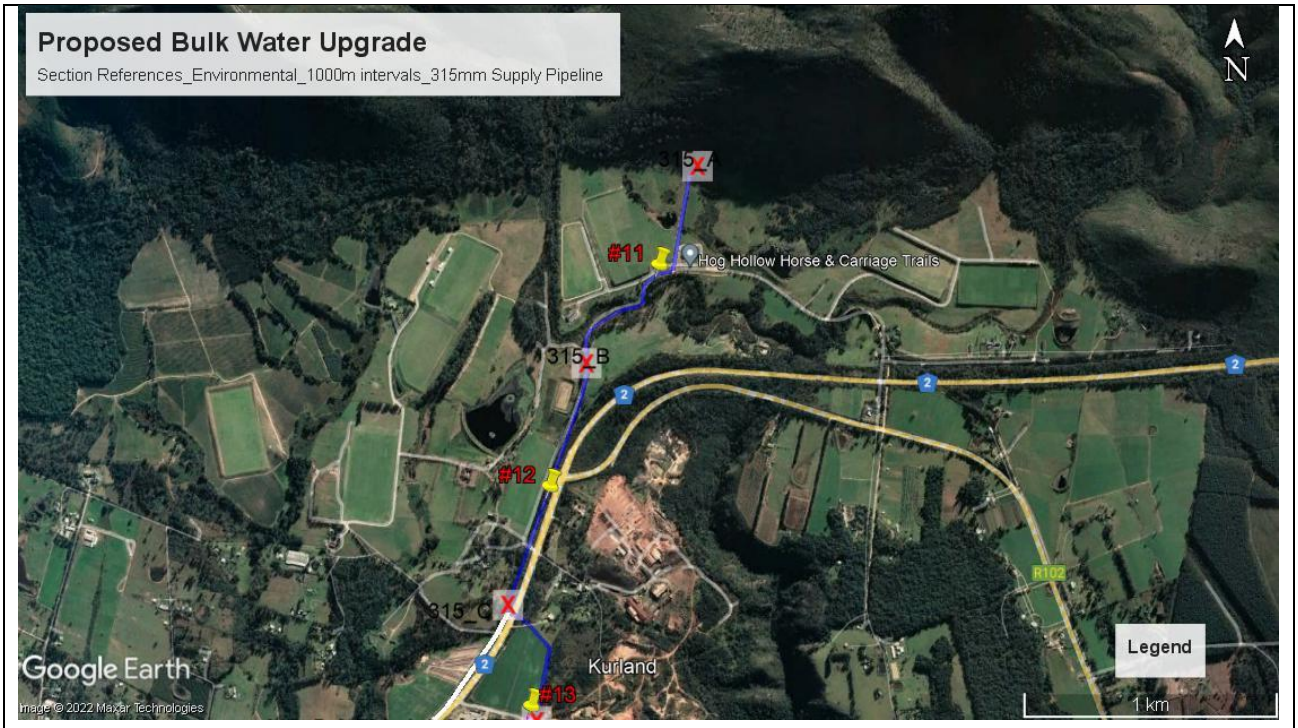


Figure 12: Proposed reference sections – 315mm Supply Pipeline.

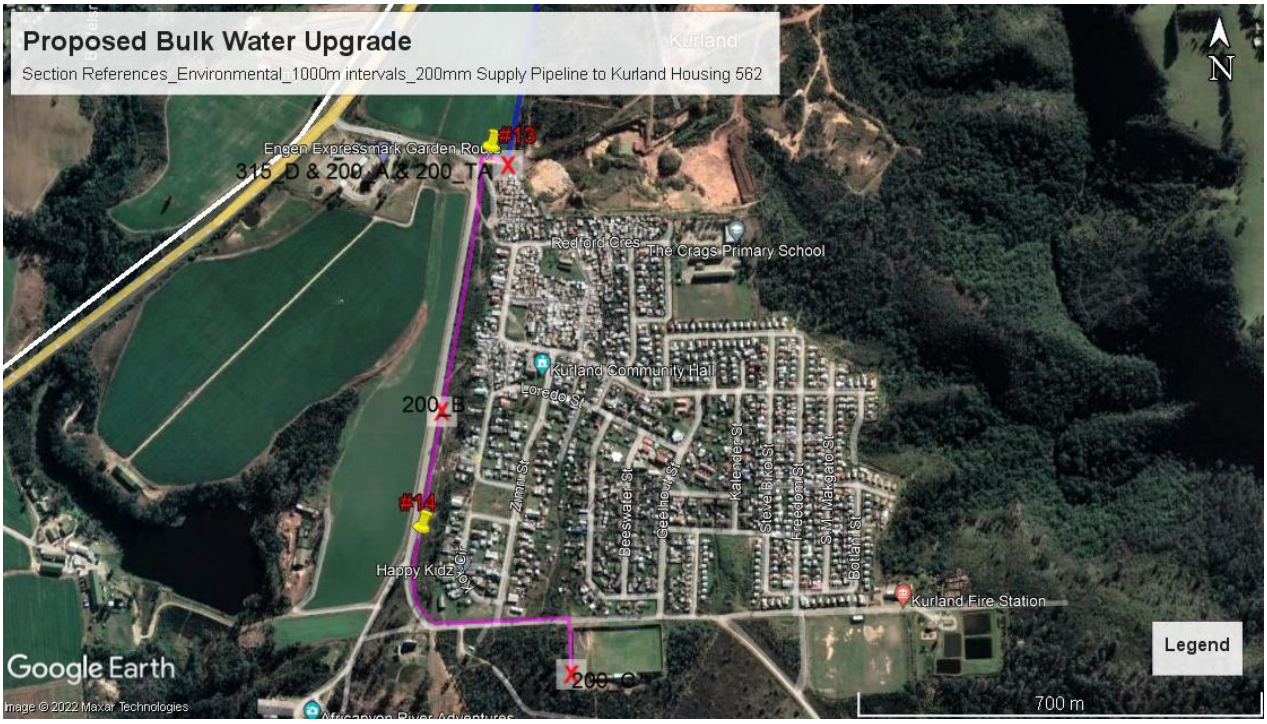


Figure 13: Proposed reference sections – 200mm Supply Pipeline to Kurland Housing 562.

Figure 14: Proposed reference sections – 200mm Supply Pipeline to Kurland Township.

Specialist input concluded is as follows:

Agricultural Compliance Statement

A Compliance Statement was undertaken by Johan Lanz (*Pr.Sci.Nat*.).

The impact of the proposed development on the agricultural production capability of the site is assessed as being acceptable. This is because the actual pipeline route has little agricultural production potential due to its location mostly along a road, and because of the temporary nature of the linear impact. The agricultural impact of the proposed development is therefore insignificant, and, from an agricultural impact point of view, it is recommended that the development be approved.

Terrestrial Biodiversity Impact Assessment & Plant Species

A Terrestrial Biodiversity and Plant Species Assessment was undertaken by Jamie Pote (*Pr. Sci. Nat*.).

All impacts are assessed to be of low to moderate significance after mitigation. It was concluded that the proposed pipeline and associated infrastructure (pump stations and reservoir) can be constructed within acceptable terrestrial biodiversity impact limits providing the recommended mitigation actions are adhered to.

- The implementation of the management actions relating to flora and fauna as well erosion and stormwater management and post construction rehabilitation will minimise biodiversity impacts.

- Should the pipeline require clearing of forest, respective permits will be required beforehand AND measures must be implemented to minimise such clearing. Such measures include a survey of the route before commencement in order to microsite the route to avoid large or important trees and may require hand excavation in certain areas to reduce the footprint so as not to significantly disturb the canopy.

It is the conclusion that due to the limited footprint and temporary nature of the proposed activity; it can be constructed within the fynbos areas without significantly compromising the broader ecological processes, nor the conservation status of the vegetation units bearing in mind specific positioning of the components within the landscape and current levels of degradation.

While indigenous fynbos species including species of conservation concern are present on the site, it can be concluded that these indigenous species occupy a small proportion of the site compared to that of the exotic (i.e., non-indigenous) and common widespread species. The species that are present, are largely within a secondary context and thus would more than likely re-establish on completion of construction, with implementation of mitigation measures.

Aquatic Biodiversity Impact Assessment

An Aquatic Biodiversity Impact Assessment was undertaken by FEN Consulting's C. Grainger (*Cand.Sci.Nat*) and reviewed by C. du Preez (*Pr. Sci. Nat*) and K. Marias (*Pr.Sci.Nat*).

Following the ecological assessment of the watercourses, the DWS Risk Assessment Matrix (2016) was applied. The results of this assessment show that assuming mitigation measures are strictly enforced, a 'Low' risk to the overall integrity of the riparian systems is expected and a 'Moderate' risk to the overall integrity of the wetlands is expected. The DEAT 2002 and 2006 informed impact assessment determined that impacts carry low impacts post mitigation provided that adequate mitigation is applied as required.

In considering the two alternative pipelines for the 200 mm supply pipeline from the Matjiesfontein reservoir to the proposed upper Matjiesfontein reservoir, it is the opinion of the specialist that either pipeline alternative route will have similar impacts to the identified watercourses as both alternatives remain within close proximity to the N2 road and traverse similar watercourses (ephemeral drainage lines). It is noted that Alternative 1 is the preferred option, however from a freshwater resource management perspective Alternative 2 is considered more preferrable as it traverses less ephemeral drainage lines than Alternative 1.

The proposed development intersects both the 32 m ZoR (NEMA) and the 100m/500 m ZoR (NWA) which would necessitate the application for Environmental Authorisation from the Department of Environmental Affairs and Development Planning (DEA&DP), and Water Use Authorisation from the Breede-Gouritz Catchment Management Agency (BGCMA). Based on the findings of the watercourse assessments and the results of the risk and impact assessment, it is the opinion of the specialist that the proposed activities pose a low to moderate risk to the integrity of the watercourses provided that adherence to cogent, well-conceived and ecologically sensitive construction plans are implemented and the mitigation measures provided in this report as well as general good construction practice are adhered to. Therefore, the proposed activities are considered acceptable.

Animal Species Assessment

An Aquatic Biodiversity Impact Assessment was undertaken by Arcus Consultancy Services South Africa (Pty) Limited's, Dr Owen Davies (Pr. Sci. Nat. - Ecology).

It was concluded that a compliance statement was applicable to the study areas as described by shape files provided by the client, including a 500m corridor. Due to the nature of the proposed development, the level of habitat transformation and presence of existing impacts along the proposed route, the study area is of very low sensitivity for terrestrial animal species. The

proposed development will not likely have a significant negative impact on the long-term viability or persistence of terrestrial animal SCC in the area. The proposed development can be approved from a Terrestrial Animal Species perspective.

NID – Heritage & Palaeontology & Archaeology

A NID was compiled by Dr Jayson Orton.

The NID concluded that given that the proposed work is mostly subsurface with the above ground components generally not in public view, there are no visual/landscape concerns. Significant archaeological impacts are highly unlikely. The only remaining concern is palaeontology but Bamford's review of the geology suggests that identifiable and scientifically useful fossils are unlikely to be revealed in the upper weathered and altered geological deposits of the study area and the soils covering them. Fresh rock exposures are not anticipated to be encountered in the trenches.

Therefore, the specialist is of the opinion that no heritage impact assessment is required.

HWC (Heritage Western Cape) has provided an ROD (Appendix E1) and has confirmed that no further studies are required.

IMPORTANT INFORMATION TO BE READ PRIOR TO COMPLETING THIS BASIC ASSESSMENT REPORT

1. **The purpose** of this template is to provide a format for the Basic Assessment report as set out in Appendix 1 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA"), Environmental Impact Assessment ("EIA") Regulations, 2014 (as amended) in order to ultimately obtain Environmental Authorisation.

2. The Environmental Impact Assessment ("EIA") Regulations is defined in terms of Chapter 5 of the National Environmental Management Act, 19998 (Act No. 107 of 1998) ("NEMA") hereinafter referred to as the "NEMA EIA Regulations".

3. The required information must be typed within the spaces provided in this Basic Assessment Report ("BAR"). The sizes of the spaces provided are not necessarily indicative of the amount of information to be provided.

4. All applicable sections of this BAR must be completed.

5. Unless protected by law, all information contained in, and attached to this BAR, will become public information on receipt by the Competent Authority. If information is not submitted with this BAR due to such information being protected by law, the applicant and/or Environmental Assessment Practitioner ("EAP") must declare such non-disclosure and provide the reasons for believing that the information is protected.

6. This BAR is current as of **November 2019**. It is the responsibility of the Applicant/ EAP to ascertain whether subsequent versions of the BAR have been released by the Department. Visit this Department's website at http://www.westerncape.gov.za/eadp to check for the latest version of this BAR.

7. This BAR is the standard format, which must be used in all instances when preparing a BAR for Basic Assessment applications for an environmental authorisation in terms of the NEMA EIA Regulations when the Western Cape Government Department of Environmental Affairs and Development Planning ("DEA&DP") is the Competent Authority.

8. Unless otherwise indicated by the Department, one hard copy and one electronic copy of this BAR must be submitted to the Department at the postal address given below or by delivery thereof to the Registry Office of the Department. Reasonable access to copies of this Report must be provided to the relevant Organs of State for consultation purposes, which may, if so indicated by the Department, include providing a printed copy to a specific Organ of State.

9. This BAR must be duly dated and originally signed by the Applicant, EAP (if applicable) and Specialist(s) and must be submitted to the Department at the details provided below.

10. The Department's latest Circulars pertaining to the "One Environmental Management System" and the EIA Regulations, any subsequent Circulars, and guidelines must be taken into account when completing this BAR.

11. Should a water use licence application be required in terms of the National Water Act, 1998 (Act No. 36 of 1998) ("NWA"), the "One Environmental System" is applicable, specifically in terms of the synchronisation of the consideration of the application in terms of the NEMA and the NWA. Refer to this Department's Circular EADP 0028/2014: One Environmental Management System.

12. Where Section 38 of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) ("NHRA") is triggered, a copy of Heritage Western Cape's final comment must be attached to the BAR.

13. The Screening Tool developed by the National Department of Environmental Affairs must be used to generate a screening report. Please use the Screening Tool link https://screening.environment.gov.za/screeningtool to generate the Screening Tool Report. The screening tool report must be attached to this BAR.

14. Where this Department is also identified as the Licencing Authority to decide on applications under the National Environmental Management: Air Quality Act (Act No. 29 of 2004) ('NEM:AQA"), the submission of the Report must also be made as follows, for-
Waste Management Licence Applications, this report must also (i.e., another hard copy and electronic copy) be submitted for the attention of the Department's Waste Management Directorate (Tel: 021-483-2728/2705 and Fax: 021-483-4425) at the same postal address as the Cape Town Office.

Atmospheric Emissions Licence Applications, this report must also be (i.e., another hard copy and electronic copy) submitted for the attention of the Licensing Authority or this Department's Air Quality Management Directorate (Tel: 021 483 2888 and Fax: 021 483 4368) at the same postal address as the Cape Town Office.

DEPARTMENTAL DETAILS

CAPE TOWN OFFICE: REGION 1 and REGION 2 **(Region 1: City of Cape Town, West Coast District)** **(Region 2: Cape Winelands District & Overberg District)**	**GEORGE OFFICE: REGION 3** **(Central Karoo District & Garden Route District)**
BAR must be sent to the following details: Western Cape Government Department of Environmental Affairs and Development Planning Attention: Directorate: Development Management (Region 1 or 2) Private Bag X 9086 Cape Town, 8000 Registry Office 1st Floor Utilitas Building 1 Dorp Street, Cape Town Queries should be directed to the Directorate: Development Management (Region 1 and 2) at: Tel: (021) 483-5829 Fax (021) 483-4372	BAR must be sent to the following details: Western Cape Government Department of Environmental Affairs and Development Planning Attention: Directorate: Development Management (Region 3) Private Bag X 6509 George, 6530 Registry Office 4th Floor, York Park Building 93 York Street George Queries should be directed to the Directorate: Development Management (Region 3) at: Tel: (044) 805-8600 Fax (044) 805 8650

MAPS

Provide a location map (see below) as Appendix A1 to this BAR that shows the location of the proposed development and associated structures and infrastructure on the property.	
Locality Map:	The scale of the locality map must be at least 1:50 000. For linear activities or development proposals of more than 25 kilometres, a smaller scale e.g., 1:250 000 can be used. The scale must be indicated on the map. The map must indicate the following: • an accurate indication of the project site position as well as the positions of the alternative sites, if any; • road names or numbers of all the major roads as well as the roads that provide access to the site(s) • a north arrow; • a legend; and • a linear scale. For ocean based or aquatic activity, the coordinates must be provided within which the activity is to be undertaken and a map at an appropriate scale clearly indicating the area within which the activity is to be undertaken. Where comment from the Western Cape Government: Transport and Public Works is required, a map illustrating the properties (owned by the Western Cape Government: Transport and Public Works) that will be affected by the proposed development must be included in the Report.
Provide a detailed site development plan / site map (see below) as Appendix B1 to this BAR; and if applicable, all alternative properties and locations.	

Site Plan:	Detailed site development plan(s) must be prepared for each alternative site or alternative activity. The site plans must contain or conform to the following: • The detailed site plan must preferably be at a scale of 1:500 or at an appropriate scale. The scale must be clearly indicated on the plan, preferably together with a linear scale. • The property boundaries and numbers of all the properties within 50m of the site must be indicated on the site plan. • On land where the property has not been defined, the co-ordinates of the area in which the proposed activity or development is proposed must be provided. • The current land use (not zoning) as well as the land use zoning of each of the adjoining properties must be clearly indicated on the site plan. • The position of each component of the proposed activity or development as well as any other structures on the site must be indicated on the site plan. • Services, including electricity supply cables (indicate aboveground or underground), water supply pipelines, boreholes, sewage pipelines, storm water infrastructure and access roads that will form part of the proposed development **must** be clearly indicated on the site plan. • Servitudes and an indication of the purpose of each servitude must be indicated on the site plan. • Sensitive environmental elements within 100m of the site must be included on the site plan, including (but not limited to): o Watercourses / Rivers / Wetlands o Flood lines (*i.e.,* 1:100 year, 1:50 year and 1:10 year where applicable); o Coastal Risk Zones as delineated for the Western Cape by the Department of Environmental Affairs and Development Planning ("DEA&DP"): o Ridges; o Cultural and historical features/landscapes; o Areas with indigenous vegetation (even if degraded or infested with alien species). • Whenever the slope of the site exceeds 1:10, a contour map of the site must be submitted. • North arrow A map/site plan must also be provided at an appropriate scale, which superimposes the proposed development and its associated structures and infrastructure on the environmental sensitivities of the preferred and alternative sites indicating any areas that should be avoided, including buffer areas.
Site photographs	Colour photographs of the site that shows the overall condition of the site and its surroundings (taken on the site and taken from outside the site) with a description of each photograph. The vantage points from which the photographs were taken must be indicated on the site plan, or locality plan as applicable. If available, please also provide a recent aerial photograph. Photographs must be attached to this BAR as **Appendix C**. The aerial photograph(s) should be supplemented with additional photographs of relevant features on the site. Date of photographs must be included. Please note that the above requirements must be duplicated for all alternative sites.
Biodiversity Overlay Map:	A map of the relevant biodiversity information and conditions must be provided as an overlay map on the property/site plan. The Map must be attached to this BAR as **Appendix D**.
Linear activities or development and multiple properties	GPS co-ordinates must be provided in degrees, minutes and seconds using the Hartebeeshoek 94 WGS84 co-ordinate system. Where numerous properties/sites are involved (linear activities) you must attach a list of the Farm Name(s)/Portion(s)/Erf number(s) to this BAR as an Appendix. For linear activities that are longer than 500m, please provide a map with the co-ordinates taken every 100m along the route to this BAR as **Appendix A3**.

ACRONYMS

DAFF:	Department of Forestry and Fisheries
DEA:	Department of Environmental Affairs
DEA& DP:	Department of Environmental Affairs and Development Planning
DHS:	Department of Human Settlement
DoA:	Department of Agriculture
DoH:	Department of Health
DWS:	Department of Water and Sanitation
EMPr:	Environmental Management Programme
HWC:	Heritage Western Cape
NFEPA:	National Freshwater Ecosystem Protection Assessment
NSBA:	National Spatial Biodiversity Assessment
TOR:	Terms of Reference

WCBSP:	Western Cape Biodiversity Spatial Plan
WCG:	Western Cape Government

ATTACHMENTS

Note: The Appendices must be attached to the BAR as per the list below. Please use a ✓ **(**tick) or a **x** (cross) to indicate whether the Appendix is attached to the BAR.

The following checklist of attachments must be completed.

APPENDIX			**✓ (Tick) or x (cross)**
Appendix A:	**Maps**		
	Appendix A1:	**Locality Map**	✓
	Appendix A2:	**Coastal Risk Zones as delineated in terms of ICMA for the Western Cape by the Department of Environmental Affairs and Development Planning**	**X**
	Appendix A3:	**Map with the GPS co-ordinates for linear activities**	✓
Appendix B:	**Appendix B1:**	**Site development plan(s)**	✓
	Appendix B2	**A map of appropriate scale, which superimposes the proposed development and its associated structures and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffer areas;**	**X**
Appendix C:	**Photographs**		✓
Appendix D:	**Biodiversity overlay map**		✓
Appendix E:	**Permit(s) / license(s) / exemption notice, agreements, comments from State Department/Organs of state and service letters from the municipality.**		
	Appendix E1:	**Final comment/ROD from HWC**	✓
	Appendix E2:	**Copy of comment from Cape Nature**	**TBD**
	Appendix E3:	**Final Comment from the DWS**	**TBD**
	Appendix E4:	**Comment from the DEA: Oceans and Coast**	**N/A**
	Appendix E5:	**Comment from the DAFF**	**TBD**
	Appendix E6:	**Comment from WCG: Transport and Public Works**	**TBD**
	Appendix E7:	**Comment from WCG: DoA**	**TBD**
	Appendix E8:	**Comment from WCG: DHS**	**TBD**

	Appendix E9:	**Comment from WCG: DoH**	**TBD**
	Appendix E10:	**Comment from DEA&DP: Pollution Management**	**TBD**
	Appendix E11:	**Comment from DEA&DP: Waste Management**	**TBD**
	Appendix E12:	**Comment from DEA&DP: Biodiversity**	**TBD**
	Appendix E13:	**Comment from DEA&DP: Air Quality**	**N/A**
	Appendix E14:	**Comment from DEA&DP: Coastal Management**	**N/A**
	Appendix E15:	**Comment from the local authority**	**TBD**
	Appendix E16:	**Confirmation of all services (water, electricity, sewage, solid waste management)**	**X**
	Appendix E17:	**Comment from the District Municipality**	**TBD**
	Appendix E18:	**Copy of an exemption notice**	**X**
	Appendix E19	**Pre-approval for the reclamation of land**	**X**
	Appendix E20:	**Proof of agreement/TOR of the specialist studies conducted.**	✓
	Appendix E21:	**Proof of land use rights**	**X**
	Appendix E22:	**Proof of public participation agreement for linear activities**	
Appendix F:	**Public participation information: including a copy of the register of I&APs, the comments and responses Report, proof of notices, advertisements and any other public participation information as is required.**		
	Appendix F1	**Interested and Affected Party (I&AP Register)**	✓
Appendix G:	**Specialist Report(s)**		
	Appendix G1:	**Agricultural Compliance Statement**	✓
	Appendix G2:	**Animal Species Impact Assessment**	✓
	Appendix G3:	**Aquatic Impact Assessment**	✓

	Appendix G4:	**Plant and Terrestrial Impact Assessment**	✓
Appendix H:	**EMPr**		✓
Appendix I:	**Screening tool report**		
	Appendix I1:	**Screening Tool A- Proposed 200mm UPVC Rising Main South of N2 – From Matjiesfontein Reservoir to proposed Matjiesfontein Upper Reservoir and Pump Station.**	✓
	Appendix I2:	**Screening Tool B - Proposed 200mm UPVC Rising Main South of N2 – From Proposed Matjiesfontein Upper Reservoir and Pump Station to tie-in.**	✓
	Appendix I3:	**Screening Tool C - Alternative_Proposed 200mm UPVC Rising Main North of N2 – From Matjiesfontein Reservoir to proposed Matjiesfontein Upper Reservoir and Pump Station.**	✓
	Appendix I4:	**Screening Tool D - Alternative Proposed 200mm UPVC Rising Main North of N2 – From Proposed Matjiesfontein Upper Reservoir and Pump Station to tie-in**	✓
	Appendix I5:	**Screening Tool E - Preferred and Alternative_Proposed 0.6ML Matjiesfontein Upper Reservoir & 22L/s Pump Station**	✓
	Appendix I6:	**Screening Tool F - Proposed 315mm UPVC Pipeline to Kurland – Similar to the 200mm Rising Main intended from the existing 160mm to the WTW's**	✓
	Appendix I7:	**Screening Tool G - Proposed 200mm UPVC Supply Pipeline to Kurland Housing 562**	✓
	Appendix I8:	**Screening Tool H - Proposed 200mm uPVC Supply Pipeline to Kurland Township**	✓
Appendix J:	**The impact and risk assessment for each alternative**		**Section H**
Appendix K:	**Need and desirability for the proposed activity or development in terms of this Department's guideline on Need and Desirability (March 2013)/DEA Integrated Environmental Management Guideline**		
Appendix…..	**Any other attachments must be included as subsequent appendices**		
Appendix L:	**Civil Engineering Report – Technical Report**		✓
Appendix M:	**100m Intervals**		✓

SECTION A: ADMINISTRATIVE DETAILS

Highlight the Departmental Region in which the intended application will fall	CAPE TOWN OFFICE:		**GEORGE OFFICE:**
	REGION 1 (City of Cape Town, West Coast District	REGION 2 (Cape Winelands District & Overberg District)	**REGION 3 (Central Karoo District & Garden Route District)**

Duplicate this section where there is more than one Proponent Name of Applicant/Proponent:	Bitou Local Municipality	
Name of contact person for Applicant/Proponent (if other):	V W Felton – Director: Engineering Services	
Company/ Trading name/State Department/Organ of State:	Bitou Municipality	
Company Registration Number:		
Postal address:	17 Marine Drive, Plettenberg Bay	
		Postal code: 6600
Telephone:	+27 (0) 44 501 3261	Cell:
E-mail:	edebruin@plett.gov.za	Fax: ( )
Company of EAP:	Sharples Environmental Services cc	
EAP name:	Ameesha Sanker	
Postal address:	PO BOX 443, Milnerton.	
		Postal code: 7435
Telephone:	(021) 554 5195	Cell:
E-mail:	ameesha@sescc.net	Fax: ( )
Qualifications:	BSc Geological Science and BSc (Hons) Environmental Management	
EAPASA registration no:	EAPASA Reg: 2022/4372	
Duplicate this section where there is more than one landowner Name of landowner:	See Appendix L: Affected Landowners.	
Name of contact person for landowner (if other):		
Postal address:		
		Postal code:
Telephone:	( )	Cell:
E-mail:		Fax: ( )
Name of Person in control of the land:	See Appendix L: Affected Landowners.	
Name of contact person for person in control of the land:		
Postal address:		
		Postal code:
Telephone:	( )	Cell:
E-mail:		Fax: ( )

Duplicate this section where there is more than one Municipal Jurisdiction Municipality in whose area of jurisdiction the proposed activity will fall:	Bitou Local Municipality	
Contact person:	Michael John Rhode	
Postal address:	Private Bag X1002 Plettenberg Bay	
		Postal code: 6600
Telephone	+27 (0) 44 501 3172	Cell:
E-mail:	mrhode@plett.gov.za	Fax: ( )

SECTION B: CONFIRMATION OF SPECIFIC PROJECT DETAILS AS INLCUDED IN THE APPLICATION FORM

1.	Is the proposed development (please tick):	**New**	✓	Expansion	
2.	Is the proposed site(s) a brownfield of greenfield site? Please explain.				

The proposal sites will be a mix of brownfield and greenfield. As the it is a linear activity and where possible existing servitudes will be utilized.

According to the Engineering Report (Appendix L), the proposed planned pipelines will have to be constructed within private property that falls within the 5m DRE building line (Road Ordinance 19 of 1976) and larger 30m Municipal building line and 60m SANRAL building line, measured from the road reserve fence. Once the final route of the proposed pipelines has been approved a land surveyor can commence the legal process of registering a services servitude to allow access to Bitou Municipality to operate and maintain the services. No compensation will be applicable to landowners due to the proposed servitude being inside the above-mentioned building lines. This, however, will need to be confirmed by the legal department of the Municipality. The extent of the servitude would be in the order of 5m wide.

Proposed 200mm Rising Main from Matjiesfontein Reservoir to the Existing 160mm tie-in:
The route can be described as greenfield however the properties are privately owned. The area planned to situate the pipeline, is relatively undeveloped, and contains alien invasive species and some tree plantations. The proposed Rising Main will be located parallel to the N2 but outside the SANRAL servitude. The proposed 200mm Rising Main will likely cross the N2, once.

Proposed 200mm Rising Main from the Existing 160mm to the Kurland WTW's:
The proposed 200mm Rising Main pipeline will be partially situated in an existing servitude, along the existing access road leading to Hog Hollow Horse & Carriage Trails, Kurland Park, The Crags, from the N2. This line will be positioned parallel to the proposed 315mm Supply Pipeline all the way to the Kurland WTW's, and will be positioned 4m from the property boundary.

Proposed 315mm Supply Pipeline to Kurland
The proposed 315mm pipeline will be partially situated in an existing servitude, along the existing access road leading to Hog Hollow Horse & Carriage Trails, Kurland Park, The Crags, from the N2. This line will be positioned parallel to the proposed 200mm Rising Main Pipeline, all the way from the Kurland WTW's, and will be positioned 2m's from the property boundary. The 315mm Supply Pipeline will cross the N2, once and will traverse private property until the North of the Kurland Township.

Proposed 200mm Supply Pipeline to Kurland Township and the Kurland Housing Development ERF562
The proposed 315mm Supply Pipeline will split east, into a proposed 200mm Supply Pipeline, toward the Kurland Township Reservoir and west, into a proposed 200mm Supply Pipeline toward the proposed Kurland Housing 562 site.

The proposed boreholes will be situated adjacent to the Kurland Water Treatment Works, access is available off of the Water Treatment Works access road.

3.	**For Linear activities or developments**
3.1.	Provide the Farm(s)/Farm Portion(s)/Erf number(s) for all routes:

POTENTIAL INFRA.	ALT LAYOUT	ALT	LAND PARCELS

	1 (PREFERRED)	LAYOUT 2	
• 200mm Rising Main • Pump station	✓	✓	MATJES FONTEIN Farm Nr 120/304; SG Code: C03900000000030400120
200mm Rising Main	✓		MATJES FONTEIN RE/2/304; SG Code: C03900000000030400002
	✓		MATJES FONTEIN RE/17/304; SG Code: C03900000000030400017;
	✓	✓	Garden Route Biosphere Reserve – Keurbooms Forest River Forest Reserve 522
		✓	MATJES FONTEIN Farm Nr 159/304; SG Code: C03900000000030400159
		✓	MATJES FONTEIN Farm Nr 181/304; SG Code: C03900000000030400181
		✓	MATJES FONTEIN RE/29/304; SG Code: C03900000000030400029
		✓	MATJES FONTEIN Farm Nr 184/304; SG Code: C03900000000030400184
		✓	MATJES FONTEIN Farm Nr 185/304; SG Code: C03900000000030400185
		✓	MATJES FONTEIN Farm Nr 197/304; SG Code: C03900000000030400197
		✓	MATJES FONTEIN Farm Nr 157/304; SG Code: C03900000000030400157
		✓	MATJES FONTEIN Farm Nr 41/304; SG Code: C03900000000030400041
		✓	MATJES FONTEIN Farm Nr 186/304; SG Code: C03900000000030400186
		✓	MATJIES FONTEIN RE/28/304; SG Code: C03900000000030400028
• 200mm Rising Main • Pump Station • New Upper Matjiesfontein Reservoir (0.6ML)	✓	✓	RE/231; SG Code: C03900000000023100000;
	✓	✓	Farm Nr 2/231; SG Code: C03900000000023100002
• 200mm Rising Main	✓		RE 1/231; SG Code: C03900000000023100001;
	✓		CRAGS VIEW Farm Nr.1/541; SG Code: C03900000000054100001
	✓		CRAGS VIEW RE/541; SG Code: C03900000000054100000
	✓		OAKHILL RE/479; SG Code: C03900000000047900000;

	✓		OAKHILL RE/1/479; SG Code: C03900000000047900001;
	✓		OAKHILL RE/7/479; SG Code: C03900000000047900007;
	✓		RE/4/293; SG Code: C03900000000029300004;
	✓		KIARUNA PRIVATE NATURE RESERVE RE/79/293; SG Code: C03900000000029300079
	✓		KIARUNA PRIVATE NATURE RESERVE RE/20/293; SG Code: C03900000000029300020;
	✓		Farm Nr 89/293; SG Code: C03900000000029300089;
	✓		Farm Nr. 293 (portion north west of Ingwe Estate 589)
	✓		Farm Nr 90/293; SG Code: C03900000000029300090;
	✓		RE/3/293; SG Code: C03900000000029300003;
		✓	AFGUNST RE 2/294; SG Code: C03900000000029400002;
		✓	AFGUNST Farm Nr 14/294; SG Code: C03900000000029400014
		✓	AFGUNST Farm Nr 15/294; SG Code: C03900000000029400015;
		✓	AFGUNST RE 7/294; SG Code: C03900000000029400007
		✓	FAIRVIEW Farm Nr 8/229; SG Code: C03900000000022900008;
		✓	FAIRVIEW Farm Nr 9/229; SG Code:C03900000000022900009;
		✓	FAIRVIEW RE 2/229; SG Code:C03900000000022900002;
		✓	AFGUNST Farm Nr 16/294; SG Code: C03900000000029400016;
		✓	Farm Nr 57/293 SG Code: C03900000000029300057
		✓	Farm Nr 58/293 SG Code: C03900000000029300058
		✓	RE 5/293; SG Code: C03900000000029300005
		✓	RE 17/293; SG Code: C03900000000029300017
		✓	Farm Nr 28/293; SG Code: C03900000000029300028
		✓	RE 20/293; SG Code: C03900000000029300020
		✓	Farm Nr 64/293; SG Code: C03900000000029300064
		✓	Farm Nr 65/293; SG Code: C03900000000029300065
		✓	Farm Nr 66/293; SG Code: C03900000000029300066
		✓	Farm Nr 15/293; SG Code: C03900000000029300015
		✓	RE 2/293; SG Code: C03900000000029300002
		✓	RE 8/293; SG Code: C03900000000029300008
		✓	RE 29/293; SG Code: C03900000000029300029
		✓	RE 14/293; SG Code: C03900000000029300014
		✓	Farm Nr 71/293; SG Code: C03900000000029300071
		✓	Farm Nr 72/293; SG Code: C03900000000029300072
		✓	DUPEVALE CONS Farm Nr 2/292; SG Code: C03900000000029200002
• 200mm Rising	✓	✓	Farm Nr 490; SG Code: C03900000000049000000;

Main • Tie-in to existing 160mm			
• 200mm Rising Main • Crossing N2	✓		KIRBYWOOD RE/20/302; SG Code: C03900000000030200020;
• 200mm Rising Main from existing 160mm Pipeline to Kurland WTW's		✓	RE/236; SG Code: C03900000000023600000;
			RE/506; SG Code: C03900000000050600000;
			BUFFELS RIVIER Farm Nr 67/288; SG Code: C03900000000028800067;
			BUFFELS RIVIER Farm Nr 69/288; SG Code: C03900000000028800069;

PROPOSED INFRASTRUCTURE	PROPERTIES AFFECTED
• 315mm Supply Water Pipeline	RE/236; SG Code: C03900000000023600000;
	RE/506; SG Code: C03900000000050600000;
	BUFFELS RIVIER Farm Nr 67/288; SG Code: C03900000000028800067;
	BUFFELS RIVIER Farm Nr 69/288; SG Code: C03900000000028800069;
	BUFFELS RIVIER Farm Nr 65/288; SG Code: C03900000000028800065;
	BUFFELS RIVIER RE/288; SG Code: C03900000000028800000;
• 200mm Supply Water Pipeline to Kurland Housing 562	ERF 58 Kurland SG: C03900060000005800000
	BUFFELS RIVIER RE/288; SG Code: C03900000000028800000;
	RE/562; SG Code: C03900000000056200000;
• 200mm Supply Water Pipeline to Kurland Township	LOT SOLWAY Farm Nr: RE/240 SG Code: C03900000000024000000
	Erf Nr: RE/117 Kurland SG Code: C03900060000011700000

3.2.	Development footprint of the proposed development for all alternatives.	m²

Rising Main Infrastructure:

Proposed Preferred Bulk Water Rising Main (200mm) UPVC to existing 160mm tie-in
- Working Development Footprint: Approximately 62 000 m²
- Final Servitude: Approximately 15 500m²

Proposed Alternative 2 Bulk Water Rising Main (200mm) UPVC
- Working corridor: Approximately 62 000 m²

- Final Servitude: Approximately 15 500m^2

Proposed Bulk Water Rising Main (200mm) UPVC from 160mm to Kurland WTW's
- Working Development Footprint: Approximately 41 000m^2
- Final Servitude: Approximately 10 250m^2

Proposed Associated Infrastructure:
- Matjiesfontein Reservoir – 35l/s at 185m head pump station
- New Proposed 600Kl Matjiesfontein Upper Reservoir with 22l/s at 195 head pump station.

Bulk Water Supply Pipeline:

Proposed 315mm Supply Pipeline to Kurland
- Working corridor: Approximately 51 200m^2
- Final Servitude: Approximately 12 800m^2

Proposed Water Pipeline to Kurland Housing Development (ERF562)
- Working corridor: 24 000m^2
- Final Servitude: Approximately 6 000m^2

Proposed 200mm Supply Pipeline to Kurland Township
- Working corridor: 6 000m^2
- Final Servitude: Approximately 1 500m^2

3.3.	Provide a description of the proposed development (e.g. for roads the length, width and width of the road reserve in the case of pipelines indicate the length and diameter) for all alternatives.

Rising Main Infrastructure:

Proposed Preferred Alternative Layout 1 - 200mm UPVC

From Matjiesfontein Reservoir to the new proposed Upper Matjiesfontein Reservoir
- Diameter: 200mm
- Working corridor: Maximum 20m
- Final Servitude: 5m
- Length: Approximately 3.1km's

From Upper Matjiesfontein Reservoir to the existing tie-in
- Diameter: 200mm
- Working corridor: Maximum 20m
- Final Servitude: 5m
- Length: Approximately 6.1 km's

From the northern side of the existing 160mm to the Kurland WTW's:
- Diameter: 200mm
- Working corridor: Maximum 20m
- Final Servitude: 5m
- Length: Approximately 2.1 km's

Total length: Approximately 11.35km's

Alternative Layout 2 – 200mm UPVC

From Matjiesfontein Reservoir to the new proposed Upper Matjiesfontein Reservoir
- Diameter: 200mm
- Working corridor: Maximum 20m
- Final Servitude: 5m
- Length: Approximately 3.1km's

From Upper Matjiesfontein Reservoir to the existing tie-in
- Diameter: 200mm
- Working corridor: 20m
- Final Servitude: 5m
- Length: Approximately 6.1 km's

From the northern side of the existing 160mm to the Kurland WTW's:
- Diameter: 200mm
- Working corridor: Maximum 20m
- Final Servitude: 5m
- Length: Approximately 2.1 km's

Total length: Approximately 11.35km's

Proposed Associated Infrastructure:

- @Matjiesfontein Reservoir – 35l/s at 185m head pump station
- New Proposed 600Kl Matjiesfontein Upper Reservoir with 22l/s at 195 head pump station.

Bulk Water Supply Pipeline:

Proposed Bulk Water Supply Pipeline (From the existing Kurland WTW's to Kurland)
- Diameter: 315mm
- Working corridor: 20m
- Final Servitude: 5m
- Length: Approximately 2.56 km's

Proposed Bulk Water Supply Pipeline (From 315mm split, toward the Kurland Housing 562)
- Diameter: 200mm
- Working corridor: 20m
- Final Servitude: 5m
- Length: Approximately 1.2km's

Proposed Bulk Water Supply Pipeline (From 315mm split, toward the Kurland Township)
- Diameter: 200mm
- Working corridor: 20m
- Final Servitude: 5m
- Length: Approximately 0.3km's

3.4.	Indicate how access to the proposed routes will be obtained for all alternatives.

All sites can potentially be accessed via the N2 and through the existing access of the private properties. Access points have not been confirmed as of yet.

3.5.	SG Digit codes of the Farms/Farm	**(see Appendix K)**

	Portions/Erf numbers for all alternatives				
3.6.	**Starting point co-ordinates for all alternatives see Appendix M**				
	Latitude (S)	°	‘	“	
	Longitude (E)	°	‘	“	
	Middle point co-ordinates for all alternatives				
	Latitude (S)	°	‘	“	
	Longitude (E)	°	‘	“	
	End point co-ordinates for all alternatives				
	Latitude (S)	°	‘	“	
	Longitude (E)	°	‘	“	
Note: For Linear activities or developments longer than 500m, a map indicating the co-ordinates for every 100m along the route must be attached to this BAR as Appendix A3.					
4.	**Other developments**				
4.1.	Property size(s) of all proposed cadastrals: Proposed New Pump Station at Matjiesfontein Reservoir: Farm No 120/304				Approximately 2.46 Ha
	Proposed New Matjiesfontein Upper Reservoir & Pump Station: RE/231				Approximately 11 Ha
	Proposed Upgrades to WTW’s: RE/236				Approximately 297.05 Ha
4.2.	Developed footprint of the existing facility and associated infrastructure (if applicable): Farm No 120/304 – existing Reservoir				Approximately 1 578.37 m^2
	RE/231 – portion of existing road (Pinehaven Rd)				Approximately 333.22 m^2
	Existing WTW’s: RE/236				Approximately 3131.58 m^2
4.3.	Development footprint of the proposed development and associated infrastructure size(s) for all alternatives: **REFER TO POINT 4.4, BELOW.**				m^2
4.4.	Provide a detailed description of the proposed development and its associated infrastructure (This must include details of e.g. buildings, structures, infrastructure, storage facilities, sewage/effluent treatment and holding facilities).				

It is recommended that the scheme be developed in phases as follows (GLS Master Planning references shown in brackets):

Phase 1: Water Treatment Works (Additional 200 Units)

- *Phase 1.1* (ALREADY FUNDED BY WSIG):

  - The water treatment works civil structures upgraded with an additional capacity of 500 Kℓ/day

  (BKW.B1)

  - A new 32 m long 200mm diameter uPVC Class 12 distribution pipe (BKW1.1)

- *Phase 1.2:*

  Mechanical and electrical works associated with water treatment works as per design report & motivation included under Annexure F2 and Annexure F3 (BKW.B1)

Phase 2: Bulk Pipeline Connecting to Erf562 from Existing network (Additional 250 Units)

- A 1 200 m long 200 mm diameter uPVC Class 12 supply pipeline be installed from existing network to Erf 562.

Phase 3: Supply Scheme from Matjiesfontein Reservoir (Additional 1630 Units)

Phase 3.1:

- A 35 ℓ/s at 185 m head pump station be constructed at Matjiesfontein Reservoir.
- A 3 080 m long 200 mm diameter uPVC Class 16 Rising Main be installed from Matjiesfontein Reservoir all along the N2 Road to a new 600 Kℓ Matjiesfontein Upper Reservoir.
- A new 600 Kℓ Matjiesfontein Upper reservoir be constructed next to the N2 Road.

Phase 3.2:

- A 22 ℓ/s at 195 head pump station be constructed at the 500 Kℓ Matjiesfontein Upper Reservoir
- A 6 100 m long 200 mm diameter uPVC Class 16 rising main be laid from the 600 Kℓ Matjiesfontein Upper Reservoir to the existing 160 mm diameter rising main (BKW.B7)
- A 2 050 m long 200 mm diameter uPVC Class 10 rising main be laid from the other end of the existing 160 mm diameter rising main to the Kurland Reservoir (BKW.B8.1b).

Phase 3.3:

- A new 1,5 Mℓ reinforced concrete Reservoir be constructed next to the existing two reservoirs.
- A 2 560 m long 315 mm diameter uPVC Class 12 supply pipeline be installed from the Kurland Reservoir towards Kurland Township (BKW1.3)
- A 330 m long 200 mm diameter uPVC Class 12 supply pipeline from where the 315 mm diameter supply pipeline stops to the Kurland Township close to the Kurland Bottom Reservoir (BKW1.2).

4.5.	Indicate how access to the proposed site(s) will be obtained for all alternatives.				
All proposed sites are accessible off of the N2, via private access roads.					
4.6.	SG Digit code(s) of the proposed site(s) for all alternatives:	**Refer to Appendix K**			
4.7.	Coordinates of the proposed site(s) for all alternatives: **Refer to Appendix K**				
	Latitude (S)	°	‘	“	
	Longitude (E)	°	‘	“	

SECTION C: LEGISLATION/POLICIES AND/OR GUIDELINES/PROTOCOLS

1. Exemption applied for in terms of the NEMA and the NEMA EIA Regulations

Has exemption been applied for in terms of the NEMA and the NEMA EIA Regulations. If yes, include a copy of the exemption notice in Appendix E18.	YES	**NO**

2. Is the following legislation applicable to the proposed activity or development.

The National Environmental Management: Integrated Coastal Management Act, 2008 (Act No. 24 of 2008) (“ICMA”). If yes, attach a copy of the comment from the relevant competent authority as Appendix E4 and the pre-approval for the reclamation of land as Appendix E19.	YES	**NO**
The National Heritage Resources Act, 1999 (Act No. 25 of 1999) (“NHRA”). If yes, attach a copy of the comment from Heritage Western Cape as Appendix E1.	**YES**	NO
The National Water Act, 1998 (Act No. 36 of 1998) (“NWA”). If yes, attach a copy of the comment from the DWS as Appendix E3.	**YES**	NO
The National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (“NEM:AQA”). If yes, attach a copy of the comment from the relevant authorities as Appendix E13.	YES	
The National Environmental Management Waste Act (Act No. 59 of 2008) (“NEM:WA”)	YES	**NO**
The National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004 (“NEMBA”).	**YES**	NO
The National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) (“NEMPAA”).	YES	**NO**

The Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983). If yes, attach comment from the relevant competent authority as Appendix E5.	YES	**NO**

3. Other legislation

List any other legislation that is applicable to the proposed activity or development.

- **SPATIAL PLANNING LAND USE MANAGEMENT ACT 16 OF 2013.**

The five founding principles as set out in Section 7 (a) to (e) of SPLUMA that apply throughout the country and to all IDPs and SDFs are:

1. Spatial Justice: Redressing past spatial and other development imbalances through improved access to and use of land by disadvantaged communities.

The proposed development by Bitou Local Municipality will improve the capacity and reliability of the bulk water supply system in Kurland, providing improved access for Kurland Village, and the future proposed Kurland Housing Development. Through facilitating access to water and access to housing development, the proposed bulk water development helps to achieve spatial justice.

2. Spatial Sustainability: Relates to the need to promote spatial planning and land use management and land development systems that are based on and promote the principles of socio-economic and environmentally sustainable development in South Africa.

The proposed development is aligned with the above principle as it intends to expand access to bulk water services as provided by the Bitou Municipal Spatial Development Framework (MSDF) (2017) and the Bitou Municipal Water Services Development Plan (2009).

3. Efficiency: The spatial efficiency pillar places significant importance on the optimization of existing resources and the accompanying infrastructure, including the filing of development application procedures in order to promote growth and employment.

The proposed development is aligned with the efficiency principles based on the following:

- the proposed 200mm rising main will be connected to an existing pipeline that goes to the Kurland Water Treatment Works (WTW)
- Existing servitudes will be utilised, this includes the existing Matjiesfontein Reservoir and existing pipeline servitudes
- the existing Kurland WTW will be upgraded, rather than building a new WTW

In addition, through enabling increased capacity and reliability of water services the proposed development will promote growth and employment of the local community.

4. Spatial Resilience: Relates to mitigation, adaptability and innovations to secure communities from spatial dimensions of socio-economic and environmental (climate change) shocks.

The increased capacity of raw water supply to the Kurland Water Treatment works will increase the water resilience of the local community during dry periods which may increase in incidence due to climatic shocks. Therefore, the proposed development secures the spatial resilience of the local community.

5. Good Administration: Spatial planning vision and objectives are not only highly dependent upon a strong co-ordinating role of central government, but is also predicated upon good governance mechanisms, incorporating meaningful consultations and coordination with a view to achieving the desired outcomes across the various planning spheres and domains.

In accordance with Sections 41 and 42 of the 2014 EIA Regulations (as amended 2017) and the Guideline on Public Participation (2013), the environmental assessment of the proposed development will be subjected to a 30-day public participation period which will allow for all registered interested and affected parties to comment on the proposed development. At a minimum, in accordance with Section 41(2)(b) of the EIA Regulations, 2014, I&APs will include:

- Owners, persons in control of, and occupiers of land adjacent to the site where proposed activity is to be undertaken
- The municipal councillor of the ward in which the site is situated
- The municipality which has jurisdiction
- Any organ of state which has jurisdiction in respect of any aspect of the activity;
- Any other party as required by the competent authority

Based on these principles, the layout and scope of this project was designed, with due consideration to the spatial dynamics of the area and how it will function as an integral part of future developments.

Legal Requirements for this project:

None required, the proposed development as planned in the Bitou Municipal IDP and SDF (2017), as well as the Bitou Municipality's Water Services Development Plan (2020), meets the requirements of SPLUMA.

- **MUNICIPAL SYSTEMS ACT (ACT 32 OF 2000)**

In accordance with Chapter 7 of the South African Constitution (1996), the Municipal Systems Act (Act 32 of 2000) mandates municipalities to:

- Give effect to the provisions of the Constitution, including
- Giving priority to the basic needs of the local community;
- Promote the development of the local community; and
- Ensure that all members of the local community have access to at least the minimum level of basic municipal services; where
- Municipal services must be
    - equitable and accessible;
    - provided in a manner conducive to the prudent, economic, efficient and effective use of available resources and the improvement of standards of quality over time
    - financially sustainable
    - environmentally sustainable; and
    - regularly reviewed with a view to upgrading, extension and improvement.

In terms of this legislation, the Bitou Local Municipality is mandated to give the local community equitable access to basic municipal services which are necessary to ensure an acceptable and reasonable quality of life. To plan for this, the Act requires municipalities to develop Integrated Development Plans (IDP) through a participatory planning approach with local communities. An IDP represents local government's primary planning mechanism for the development of the municipality which must include, inter alia,

- an assessment of the existing level of development in the municipality, which 20 must include an identification of communities which do not have access to basic municipal services;
- a spatial development framework which must include the provision of basic guidelines for a land use management system for the municipality; and

- the key performance indicators and performance targets

In accordance with the above mandate, the Bitou Municipal IDP (2017) identified the municipality's "most critical development and internal transformation needs" as, inter alia:

- Water: No dams, limited water supply, lack of potable water.
- Infrastructure: Limited bulk infrastructure, landfill site needs, challenges with maintenance of Infrastructure

Added to this, it identified that the local community in Kurland, municipal Ward 1, has the worst access to water statistics in the municipality; with more than 6% of households having no access to potable water. For this purpose, KPA 4 Infrastructure Development: determines Objective 4.1 as to ensure 'Universal access to decent quality of services'. In line with KPA 4, the proposed development of bulk water services in Kurland, Ward 1, is earmarked as strategic development project in the current Bitou IDP 2017-2022 (2017) and the Water Services Development Plan (2020). The proposed development of bulk water infrastructure will enable the municipality to meet its mandate in terms of Chapter 7 of the Constitution (1996) and the Municipal Systems Act (Act 32 of 2000) to deliver basic municipal services to the Kurland community.

Legal Requirements for this project:

None required, the proposed development as planned in the Bitou Municipal IDP and SDF (2017), as well as the Bitou Municipality's Water Services Development Plan (2020), will aid Bitou Municipality in meeting its mandate as provided by the Municipal Systems Act (Act 32 of 2000).

- **WATER SERVICES ACT (ACT 108 OF 1997), as amended 2005**

The main objectives of the national Water Services Act (Act 108 of 1997) (WSA), as amended 2005, is to provide for, inter alia

- The right of access to basic water supply and the right to basic sanitation necessary to secure sufficient water and an environment not harmful to human health or wellbeing;
- The preparation and adoption of water services development plans by water services authorities to realise the right to basic water supply;
- The promotion of effective water resource management and conservation.

Bitou Local Municipality functions as a Water Services Authority (WSA) which is defined as any municipality, including a district or rural council, responsible for ensuring access to water services. WSAs are mandated to progressively ensure efficient, affordable, economical, and sustainable access to water services to all consumers or potential consumers in its area of jurisdiction. As set out in Bitou Municipality's Water Services Development Plan (2020), the proposed Kurland bulk water infrastructure is the municipality's fulfilment of its mandate to progressively provide sustainable access to water services to all existing consumers (e.g. Kurland Village) and potential consumers (e.g. future proposed Kurland Hosing Development). Bitou Municipality's Water Services Development Plan (2020) is discussed in greater detail in the forthcoming section.

Legal Requirements for this project:

None required, the proposed development as planned in the Bitou Municipal Water Services Development Plan (2020), meets the requirements of the Water Services Act.

- **National Norms and Standards for Domestic Water and Sanitation Services (GN. 982 of 2017)**

The National Norms and Standards for Domestic Water and Sanitation Services (GN. 982 of 2017)

reiterates that it is a municipal mandate to ensure the realisation of the right of access to basic water supply. It states that it is the responsibility of municipalities, as WSAs, to ensure that

> "adequate and appropriate investments are made to ensure the progressive realisation of the right of all people in its area of jurisdiction to receive at least a basic level of water and sanitation services; i.e. a universal service obligation."

The Norms and Standards state that people who do not have access to safe water, or who access water from insecure or unimproved sources, or sources that are too distant, too time consuming or are of poor quality, fall into the 'no service' category and constitute the water backlog. As per the Bitou IDP (2017), the water backlog in Ward 1, the ward in which Kurland and the proposed development are located, has the worst access to water statistics in the municipality; with a water backlog of more than 6%.

To alleviate the water backlog, bulk infrastructure needs to have adequate capacity to enable settlement and household level services. To achieve this, the Norms and Standards state that:

1) A water services authority shall ensure that adequate bulk water supply is available to enable water services.
2) A bulk water storage and distribution system shall be appropriate for the area in terms of cost, complexity, and maintenance requirements in ensuring a continuous supply.
3) Some treatment of the raw water may be necessary to ensure that water is safe for human consumption.
4) Cognisance shall be taken of pressure requirements for annual average daily flow, peak flows, seasonal variations, and friction factors due to deterioration of pipes.
5) In order to prepare for different flows, all water use and/or supply shall be metered.
6) The supply of bulk water shall follow the Guidelines for the Design of Water Supply Systems and the relevant standards as set out by the SABS for pipes, valves and connections.

The proposed bulk water infrastructure is planned in the Bitou Municipal Water Services Development Plan (2020) and detailed in the "Technical Report for Upgrading of Kurland Water Sources, Water Treatment Works, Reservoir and Bulk Supply Pipelines", Revision 5, dated October 2022, authored by Neil Lyners & Associates (RF)(Pty) Ltd. As detailed in these documents, the proposed development meets the requirements of the National Norms and Standards for Domestic Water and Sanitation Services (2017).

Legal Requirements for this project:

No further legal requirements.

- **DEEDS REGISTERIES ACT (ACT 47 OF 1937), as amended 2013**

The Deeds Registries Act (Act 47 of 1937), amended 2013, provides for the registration of servitudes with the Deeds Registry, commonly referred as the Deeds Office. A servitude is a limited real right over immovable property. This right is registrable and allows the holder of the servitude to exercise some right over another's person's property. Public servitudes are created in favour of the public. The servitude is registered as a condition against the title deeds to the property in the Deeds Registry and is binding on all current and subsequent owners of those properties.

In respect of the proposed development, the municipality will be required to register servitudes where the proposed infrastructure is located outside of existing servitudes, not on municipal property, and where it is located on private property. This for instance, will be required where the proposed pipeline is located up to 6m within the 60m building line of private properties along the N2.

In terms of Sections 32, 75 and 76 of the Act, public servitude registrations may either take place by means of a Section 32 registration of expropriated servitudes or servitudes vested by statute or a Section 75 registration of a notarial deed accompanied by an appropriate endorsement against the title deed of the property in respect of which the servitude is granted, in accordance with the Section 76 conditions of registration of praedial servitudes.

Legal Requirements for this project:

Where servitudes do not exist and the pipeline and associated infrastructure are to be located on private property, the Bitou Municipality is required to undertake the registration procedures as specified in the Deeds Registries Act (Act 47 of 1937), amended 2013, to register servitudes with the Deeds Registry.

- **THE SOUTH AFRICAN NATIONAL ROADS AGENCY AND NATIONAL ROADS ACT (ACT 7 OF 1998)**

The majority of the proposed development is situated along the National Road 2 (N2), which falls under the jurisdiction of the South African National Roads Agency (SANRAL). Access to the proposed development sites will require construction vehicles to make use of the N2, therefore, the South African National Roads Agency (SANRAL) and National Roads Act (Act 7 of 1998) is applicable to the proposed development, particularly during the construction phase.

In terms of Section 45, SANRAL may close a national road to traffic or divert the roadway whenever in its opinion it is necessary and desirable to do so. With respect to road crossings for the proposed pipelines, Section 48 of the National Roads Act (1998) provides that "no person may do any of the following things without the agency's written permission, namely

- on or over, or below the surface of, a national road or land in a building restriction area, erect, construct or lay, or establish any structure or other thing (including anything which is attached to the land on which it stands even though it does not form part of that land);
- make any structural alteration or addition to a structure or that other thing situated on or over, or below the surface of, a national road or land in a building restriction area;
- give permission for erecting, constructing, laying or establishing any structure or that other thing on or over, or below the surface of, a national road or land in a building restriction area, or for any structural alteration or addition to any structure or other thing so situated."

Legal Requirements for this project:

The proposed pipeline involves 2 subsurface road-crossings of the N2 national road. Therefore, Bitou Local Municipality is required to obtain written permission/a wayleave from SANRAL for the road crossings as required by the SANRAL and National Roads Act (Act 7 of 1998).

- **NATIONAL WATER ACT (ACT 36 OF 1997)**

The purpose of the National Water Act (Act 36 of 1997) is to provide for the management and protection of water resources. Chapter 5 of the NWA states that the NWA is founded on the principle that National Government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest. Therefore, a person can only be entitled to use water if the use is permissible under the NWA. Section 21 of the NWA provides for eleven water use activities that require authorisation from the Department of Water and Sanitation, or where operational, the applicable Catchment Management Agency.

As informed by the aquatic specialist study, conducted by Cole Grainger of FEN Consulting (Pty)

Ltd, the following Section 21 water use activities are applicable to the proposed development:

(a) Taking water from a water resource;
(b) Storing water;
(c) Impeding or diverting the flow of water in a watercourse
(i) Altering the bed, banks, course or characteristics of a watercourse.

Water Use Licence Applications (WULA) must be undertaken in accordance with Sections 40 and 41 of the NWA.

Legal Requirements for this project:

A WULA is in the process of being submitted to the Breede-Gouritz Catchment Management Agency in terms of the National Water Act (Act 36 of 1998) for the Section 21 (a), (c), (b), and (i) water uses. WULA application reference: WU24786.

4. Policies

Explain which policies were considered and how the proposed activity or development complies and responds to these policies.

Policies addressed in Section E of this BAR:

- Western Cape Provincial SDF (2014)
- Bitou Municipal Spatial Development Framework (MSDF) (2017)
- Bitou Municipal Integrated Development Plan (2017)
- Bitou Land Use Planning By-law (2015)

Other policies:

- **BITOU WATER SUPPLY, SANITATION SERVICES AND INDUSTRIAL WASTE BY-LAW (2009)**

The Bitou Water Supply, Sanitation Services and Industrial Waste By-law (2009) was promulgated to ensure the realisation of the municipality's mandate to ensure potable water supply systems and domestic waste-water and sewage disposal systems as prescribed in Schedule 4 Part B of the South African Constitution (1996).

The By-law states that the quantity, quality and pressure characteristics of water supply services provided by the municipality will comply as far as reasonably possible with the minimum standards set for the provision of water supply services in terms of Section 9 of the Water Services Act (Act 108 of 1997). In accordance with Section 9 of the Water Services Act (1997), as amended 2005, Section 4 of the National Norms and Standards for Domestic Water and Sanitation Services (GN. 982 of 2017) provides the water quality, pressure, metering, tariffing, re-use, and asset management norms and standards.

Legal Requirements for this project:

The Bitou Local Municipality, the proponent, is required to ensure that the proposed bulk water infrastructure and its subsequent provision of water services complies with the National Norms and Standards for Domestic Water and Sanitation Services (GN. 982 of 2017). This is addressed in preceding section of this BAR.

- **BITOU MUNICIPALITY WATER SERVICES DEVELOPMENT PLAN (2020)**

In accordance with the Water Services Act (Act 108 of 1997), Bitou Local Municipality's Water Services Development Plan (2020) (WSDP) sets out the municipality's plans for future water and sanitation demand management and functionality requirements. To meet present and future

water demand due to development and population growth, Bitou Municipality recommended upgrades of the water infrastructure to the Plettenberg Bay, Natures Valley, Harkerville and Kurland bulk water infrastructure. The WSDP (2020) reports that the of the four Water Treatment Works, Kurland WTW is the only facility which does not have adequate treatment capacity to meet water demand as projected for the next 10 years. The WSDP, therefore, proposed that Kurland bulk water infrastructure be upgraded as follows:

It is recommended that the scheme be developed in phases as follows (GLS Master Planning references shown in brackets):

Phase 1: Water Treatment Works (Additional 200 Units)

- *Phase 1.1* (ALREADY FUNDED BY WSIG):

  - The water treatment works civil structures upgraded with an additional capacity of 500 Kℓ/day
  (BKW.B1)

  - A new 32 m long 200mm diameter uPVC Class 12 distribution pipe (BKW1.1)
- *Phase 1.2:*

  Mechanical and electrical works associated with water treatment works as per design report & motivation included under Annexure F2 and Annexure F3 (BKW.B1)

Phase 2: Bulk Pipeline Connecting to Erf562 from Existing network (Additional 250 Units)

- A 1 200 m long 200 mm diameter uPVC Class 12 supply pipeline be installed from existing network to Erf 562.

Phase 3: Supply Scheme from Matjiesfontein Reservoir (Additional 1630 Units)

Phase 3.1:

- A 35 ℓ/s at 185 m head pump station be constructed at Matjiesfontein Reservoir.
- A 3 080 m long 200 mm diameter uPVC Class 16 Rising Main be installed from Matjiesfontein Reservoir all along the N2 Road to a new 600 Kℓ Matjiesfontein Upper Reservoir.
- A new 600 Kℓ Matjiesfontein Upper reservoir be constructed next to the N2 Road.

Phase 3.2:

- A 22 ℓ/s at 195 head pump station be constructed at the 500 Kℓ Matjiesfontein Upper Reservoir
- A 6 100 m long 200 mm diameter uPVC Class 16 rising main be laid from the 600 Kℓ Matjiesfontein Upper Reservoir to the existing 160 mm diameter rising main (BKW.B7)
- A 2 050 m long 200 mm diameter uPVC Class 10 rising main be laid from the other end of the existing 160 mm diameter rising main to the Kurland Reservoir (BKW.B8.1b).

Phase 3.3:

- A new 1,5 Mℓ reinforced concrete Reservoir be constructed next to the existing two reservoirs.
- A 2 560 m long 315 mm diameter uPVC Class 12 supply pipeline be installed from the

Kurland Reservoir towards Kurland Township (BKW1.3)

- A 330 m long 200 mm diameter uPVC Class 12 supply pipeline from where the 315 mm diameter supply pipeline stops to the Kurland Township close to the Kurland Bottom Reservoir (BKW1.2).

Therefore, the proposed development is contemplated and strategically planned in the Bitou Municipality Water Services Development Plan (2020).

Legal Requirements for this project:
No further legal requirements.

- **BITOU ROADS AND STREETS BY-LAW (2009)**

Section 38 of the Bitou Roads and Streets By-law provides for the temporary closure of streets or roads and diversion of traffic for the purpose of the construction, erection, laying, extension, maintenance, repair or demolition of any building, structure, works or service alongside, on, across, through, over or under such street.

These requirements are applicable to municipal roads and streets. Where construction activity impacts on the N2, in relation to road crossings, the Bitou Municipality is required to comply with the SANRAL and National Roads Act (Act 7 of 1998).

Legal Requirements for this project:

Should temporarily close roads and streets under municipal authority be necessary during the construction phase of the proposed development, the municipality may exercise its rights under Section 38 of the Roads and Streets By-law. Where construction activity impacts the N2, the Bitou Municipality is required to comply with the SANRAL and National Roads Act (Act 7 of 1998) and all applicable applications associated therewith.

- **BITOU SOLID WASTE DISPOSAL BY-LAW AND THE EDEN DISTRICT MUNICIPALITY WASTE MANAGEMENT BY-LAW (2017)**

The Bitou Solid Waste Disposal By-law was promulgated to promote the achievement of a safe and healthy environment for the benefit of residents within the area of jurisdiction of the municipality, and to provide for procedures, methods and practices to promote waste management activities. The Bitou Solid Waste Disposal By-law provides for the separation of waste and the establishment of waste disposal sites. Section 7 provides that only a person who has paid the prescribed fees or who is in the possession of a written permission from the municipality may dispose of waste at a disposal facility.

The Garden Route District Municipality, formerly the Eden District, Waste Management By-law (2017) was promulgated to provide an effective, legal and administrative framework, within which the District Municipality can manage and regulate waste management activities. As per the District Waste Management By-law (2017), building waste must be disposed of at a designated building waste handling facility or a designated bulk waste transfer station. As set out in the Bitou Local Municipality Integrated Waste Management Plan (2019), builders' rubble disposal facilities include the Ukhana KK Sands disposal facility located on the N2, Harkerville.

Legal Requirements for this project:
The waste management requirements provided in the Bitou Solid Waste Disposal By-law and the District Waste Management By-law (2017) will be translated into the EMPr for implementation on site during the construction phase.

5. Guidelines

List the guidelines which have been considered relevant to the proposed activity or development and explain how they have influenced the development proposal.

Guidelines	**How the proposed development complies with and responds to the relevant guideline**
Guideline on Public Participation (2013)	Guideline considered in undertaking of the public participation for the proposed development. All relevant provisions contained in the guideline were adhered to in the basic assessment process as appropriate.
Guideline on Need and Desirability (2017)	Guideline considered during the assessment of the Need and Desirability of the proposed development project.
Guideline on Environmental Management Plans (2005)	Guideline considered in the compilation of the EMPr attached to this Basic Assessment Report.
Guideline for the Review of Specialist Input into the EIA Process (2005)	Guideline considered during the review and integration of specialist input into this Basic Assessment Report.
External Guideline: Generic Water Use Authorization Application Process (2007)	Guideline considered during the process of applying for the required water use authorization.
Integrated Environmental Management Information Series 5: Impact Significance (2002)	Guideline considered during the identification and evaluation of potential impacts associated with the proposed development, and the reporting thereof in this Basic Assessment Report
Integrated Environmental Management Information Series 7: Cumulative Effects Assessment (2004)	Guideline considering during the assessment of the cumulative effect of the identified impacts.
Circular EADP 0028/2014: One Environmental Management System	Guideline regulating multiple environmental activities under NEMA, including mining related activities.
Guideline for determining the scope of specialist involvement in EIA processes, June 2005.	Guideline considered when determining the scope of specialist involvement for this assessment.
Guideline for review of specialist input in the EIA process (June 2005)	Guideline considered when reviewing specialist involvement for this assessment.
Guideline for involving visual and aesthetic specialists in the EIA process (June 2005)	Guideline considered to guide specialist involvement for this assessment.
Guideline on generic terms of Reference for EAPs and Project Schedules (March 2013)	Guideline has been considered to guide EAP and Project Schedule requirements.

6. Protocols

Explain how the proposed activity or development complies with the requirements of the protocols referred to in the NOI and/or application form

On March 20th, 2020, and August 2020, the protocols for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(A) and (H) and 44 of the National Environmental Management Act, 1998, when applying for environmental authorisation, were promulgated.

The following table provides a summary of the development footprint environmental sensitivities identified by the DEA Screening Tool Report of 23 February 2022 and 1st November 2022 (see Appendix D).

Table 3: Labels allocated to Screening Tools

LABEL	*SCREENING TOOL REPORT*
A	Proposed 200mm UPVC Rising Main South of N2 – From Matjiesfontein Reservoir to proposed Matjiesfontein Upper Reservoir and Pump Station.
B	Proposed 200mm UPVC Rising Main South of N2 – From Proposed Matjiesfontein Upper Reservoir and Pump Station to tie-in.
C	Alternative_Proposed 200mm UPVC Rising Main North of N2 – From Matjiesfontein Reservoir to proposed Matjiesfontein Upper Reservoir and Pump Station.
D	Alternative Proposed 200mm UPVC Rising Main North of N2 – From Proposed Matjiesfontein Upper Reservoir and Pump Station to tie-in
E	Preferred and Alternative_Proposed 0.6ML Matjiesfontein Upper Reservoir & 22L/s Pump Station
F	Proposed 315mm UPVC Pipeline to Kurland – Similar to the 200mm Rising Main intended from the existing 160mm to the WTW's
G	Proposed 200mm UPVC Supply Pipeline to Kurland Housing 562
H	Proposed 200mm uPVC Supply Pipeline to Kurland Township

Table 4: Summary of the environmental sensitivities for the proposed sites.

Theme	**Sensitivity**			
	Very High	**High**	**Medium**	**Low**
Agriculture Theme		**A;B;C;D;F;G;H**	**E**	
Animal Species Theme		**A;B;C;D;E;F;G**	**H**	
Aquatic Biodiversity Theme	**B;D;F;G;H**			**A;C;E**
Archaeological and Cultural Heritage Theme				**A;B;C;D;E;F;G;H**
Civil Aviation Theme		**A;B;C;D;E;**	**F;G;H**	
Defence Theme				**A;B;C;D;E;F;G; H**
Palaeontology Theme	**A;B;C;D**	**F;G**		**E; H**
Plant Species Theme			**A;B;C;D;E;F;G; H**	
Terrestrial Biodiversity Theme	**A;B;C;D;E;F;G; H**			

Based on these results, the Screening Tool recommended the following specialist assessments be conducted:

- Agricultural Compliance Statement
- Archaeological and Cultural Heritage Impact Assessment
- Palaeontology Impact Assessment
- Terrestrial Biodiversity Impact Assessment

- Aquatic Biodiversity Impact Assessment
- Geotechnical Assessment
- Socio-Economic Assessment
- Plant Species Compliance Statement
- Animal Species Assessment

In addition to the above, the Screening tool report for the proposed Upper Matjiesfontein Reservoir and Pump Station further recommended

- Landscape-Visual Impact Assessment
- Civil Aviation Assessment

Based on the location and sensitivities identified, following specialist reports were undertaken:

- Agricultural Compliance Statement
- Animal Species Assessment
- Aquatic Biodiversity Impact Assessment
- Plant Species Assessment
- Terrestrial Biodiversity Impact Assessment

STUDY	***SPECIALIST***	***SENSITIVITY THEME AIMING TO BE ADDRESSED***
Aquatic Biodiversity Compliance Statement	Cole Granger of FEN Consulting (Pty) Ltd	Aquatic
Agricultural Compliance Statement	Johann Lanz	Agriculture
Animal Species Assessment	Arcus Consulting Services South Africa (Pty) Ltd	Animal Species
Plant Species Assessment	Jamie Pote	Plant Species
Terrestrial Biodiversity Impact Assessment	Jamie Pote	Terrestrial Biodiversity
Geotechnical Assessment	Neil Lyners & Associates (RF)(Pty) Ltd	Geotechnical

- The Aquatic Compliance Statement was undertaken in accordance with the Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Aquatic Biodiversity (20 March 2020).
- The Agricultural Compliance Statement was undertaken in accordance with the Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Agricultural Resources (20 March 2020).
- The Animal Species Assessment was undertaken in accordance with the Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Animal Species (30 October 2020).
- The Plant Species Assessment was undertaken in accordance with the Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Plant Species (30 October 2020).
- The Terrestrial Biodiversity Impact Assessment was undertaken in accordance with the Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity (20 March 2020).

The Geotechnical Investigation was undertaken by Neil Lyners & Associates (RF)(Pty) Ltd and reported in their "Technical Report for Upgrading of Kurland Water Sources, Water Treatment Works, Reservoir and Bulk Supply Pipelines", dated October 2022.

SECTION D: APPLICABLE LISTED ACTIVITIES

List the applicable activities in terms of the NEMA EIA Regulations

Activity No(s):	Provide the relevant **Basic Assessment Activity(ies)** as set out in **Listing Notice 1**	Describe the portion of the proposed development to which the applicable listed activity relates.
12	[The development of— (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs— **(a) within a watercourse;** (b) in front of a development setback; or **(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; —** excluding— (aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such development occurs within an urban area; [or] (ee) where such development occurs within existing roads, [or] road reserves	The proposed activity is applicable. There is potential for 100m^2 of infrastructure to be situated in and within 32ms of a watercourse.

	or railway line reserves; or (ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.	
19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from **a watercourse;** but excluding where such infilling, depositing, dredging, excavation, removal or moving— (f) will occur behind a development setback; (g) is for maintenance purposes undertaken in accordance with a maintenance management plan; (h) falls within the ambit of activity 21 in this Notice, in which case that activity applies; (i) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies	The proposed activity is applicable. Watercourse crossings will entail the excavations through the existing watercourses/drainage lines, that will result in at least 10 cubes of soil being infilled, deposited, dredged, excavated, or removed.
Activity No(s):	Provide the relevant **Basic Assessment Activity(ies)** as set out in **Listing Notice 3**	Describe the portion of the proposed development to which the applicable listed activity relates.
2	The development of **reservoirs,** excluding dams, with a capacity of **more than 250 cubic metres.** i. Western Cape i. A protected area identified in terms of NEMPAA, excluding conservancies; ii. **In areas containing indigenous vegetation; or** ~~iii. Inside urban areas:~~	The proposed development will support the construction of a 0.6ML Reservoir, and as confirmed by the Biodiversity Specialist, this area does contain indigenous vegetation. Therefore, this activity is triggered.

	~~(aa) Areas zoned for use as public open space; or~~ ~~(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, or zoned for a conservation purpose. This listed activity may be triggered, due to areas containing indigenous vegetation.~~	
12	The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. Western Cape (vi) Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; (vii) Within critical biodiversity areas identified in bioregional plans; (viii) Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; (ix) On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning; or (x) On land designated for protection or conservation purposes in an Environmental Management Framework adopted in the prescribed manner, or a Spatial Development Framework	The proposed activity is applicable, as the proposed pipelines will occur within areas indicated as CBA's.

	adopted by the MEC or Minister.	
14	The development of— (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs— (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour. i. Western Cape i. Outside urban areas: (aa) A protected area identified in terms of NEMPAA, excluding conservancies; (bb) National Protected Area Expansion Strategy Focus areas; (cc) World Heritage Sites; (dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (ee) Sites or areas listed in terms of an international convention; (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (gg) Core areas in biosphere reserves; or (hh) Areas on the estuary side of the development setback line or in an estuarine functional zone where no such setback line has been determined.	The proposed activity is applicable, as the proposed pipelines will occur within areas indicated as CBA's.

Note:

- The listed activities specified above must reconcile with activities applied for in the application form. The onus is on the Applicant to ensure that all applicable listed activities are included in the application. If a specific listed activity is not included in an Environmental Authorisation, a new application for Environmental Authorisation will have to be submitted.
- Where additional listed activities have been identified, that have not been included in the application form, and amended application form must be submitted to the competent authority.

List the applicable waste management listed activities in terms of the NEM:WA

~~Activity No(s):~~	~~Provide the relevant **Basic Assessment Activity(ies)** as set out in **Category A**~~	~~Describe the portion of the proposed development to which the applicable listed activity relates.~~

List the applicable listed activities in terms of the NEM:AQA

~~Activity No(s):~~	~~Provide the relevant **Listed Activity(ies)**~~	~~Describe the portion of the proposed development to which the applicable listed activity relates.~~

SECTION E: PLANNING CONTEXT AND NEED AND DESIRABILITY

1.	Provide a description of the preferred alternative.

It is recommended that the scheme be developed in phases as follows (GLS Master Planning references shown in brackets):

Phase 1: Water Treatment Works (Additional 200 Units)

- *Phase 1.1* (ALREADY FUNDED BY WSIG):

  - The water treatment works civil structures upgraded with an additional capacity of 500 Kℓ/day
  (BKW.B1)

  - A new 32 m long 200mm diameter uPVC Class 12 distribution pipe (BKW1.1)
- *Phase 1.2:*

  Mechanical and electrical works associated with water treatment works as per design report & motivation included under Annexure F2 and Annexure F3 (BKW.B1)

Phase 2: Bulk Pipeline Connecting to Erf562 from Existing network (Additional 250 Units)

- A 1 200 m long 200 mm diameter uPVC Class 12 supply pipeline be installed from existing network to Erf 562.

Phase 3: Supply Scheme from Matjiesfontein Reservoir (Additional 1630 Units)

Phase 3.1:

- A 35 ℓ/s at 185 m head pump station be constructed at Matjiesfontein Reservoir.
- A 3 080 m long 200 mm diameter uPVC Class 16 Rising Main be installed from Matjiesfontein Reservoir all along the N2 Road to a new 600 Kℓ Matjiesfontein Upper Reservoir.
- A new 600 Kℓ Matjiesfontein Upper reservoir be constructed next to the N2 Road.

Phase 3.2:

- A 22 ℓ/s at 195 head pump station be constructed at the 500 Kℓ Matjiesfontein Upper Reservoir
- A 6 100 m long 200 mm diameter uPVC Class 16 rising main be laid from the 600 Kℓ Matjiesfontein Upper Reservoir to the existing 160 mm diameter rising main (BKW.B7)
- A 2 050 m long 200 mm diameter uPVC Class 10 rising main be laid from the other end of

the existing 160 mm diameter rising main to the Kurland Reservoir (BKW.B8.1b).

Phase 3.3:

- A new 1,5 Mℓ reinforced concrete Reservoir be constructed next to the existing two reservoirs.
- A 2 560 m long 315 mm diameter uPVC Class 12 supply pipeline be installed from the Kurland Reservoir towards Kurland Township (BKW1.3)
- A 330 m long 200 mm diameter uPVC Class 12 supply pipeline from where the 315 mm diameter supply pipeline stops to the Kurland Township close to the Kurland Bottom Reservoir (BKW1.2).

2.	Explain how the proposed development is in line with the existing land use rights of the property as you have indicated in the NOI and application form? Include the proof of the existing land use rights granted in Appendix E21.

In accordance with the Bitou Municipal Zoning By-law (2020), the properties along the proposed bulk water pipeline route are mostly private, and the majority are zoned as Agricultural Zone I (see Figure 15). The proposed pipelines, as well as proposed new pumpstation and reservoir (Upper Matjiesfontein), are intended to be positioned up to 6m within the 60m building line of the private properties (mostly), adjacent to the N2.

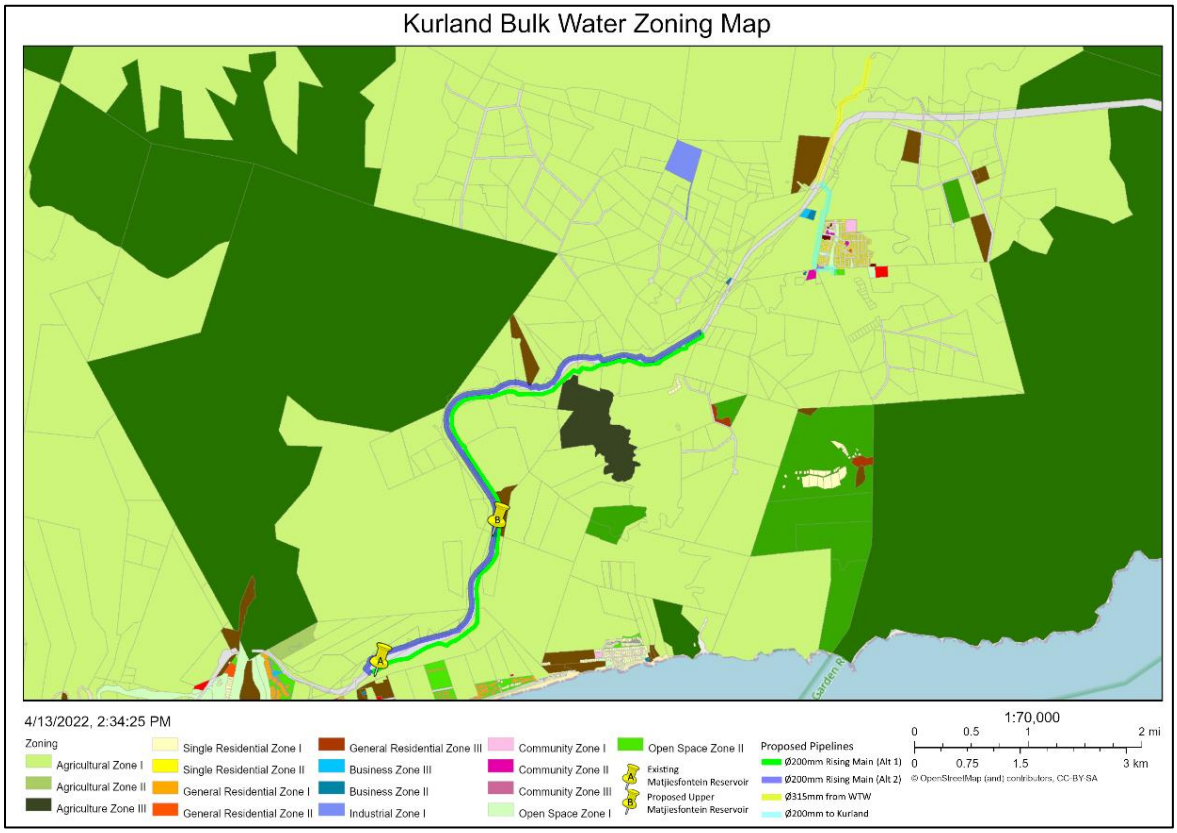


Figure 15: Landuse Zoning Map

In addition, there are single properties, along the preferred Ø200mm Rising Main, zoned as:

- Resort Zone (Rezoning of Portion 3 of Farm 294 from Agriculture I to Resort I - Farm stall, tourist facility and farm stall),
- Potentially Agriculture Zone III (Agriculture I to Special Zone Rural conservation with approval of 19 Sectional Title units and permaculture activities and a Farm stall - Holiday

Accommodation (19 Sectional Title Units))
- Transport Zone II (Both Ø200mm to Kurland and Rising Main)

The Ø200mm pipeline to Kurland also traverses an area that is zoned as:
- Community Zone II, intended landuse is a Church (Rezoning from Open Space I to Institutional II and Residential I (Erven) - Subdivision into 1 Church site and 2 Residential Erven approved but not implemented).
- Open Space Zone I.

Existing servitudes are available and will be utilized where possible.

A servitude will need to be registered by the municipality, for the rising main and the proposed new reservoir and pumpstation, along the N2.

3.	Explain how potential conflict with respect to existing approvals for the proposed site (as indicated in the NOI/and or application form) and the proposed development have been resolved.

No existing approvals for the proposed site, and the proposed development have been identified. Therefore, no conflict has arisen.

4.	Explain how the proposed development will be in line with the following?
4.1	The Provincial Spatial Development Framework.

The Western Cape's Provincial SDF (PSDF) (2014) explains that its overall aim is to:
- Give spatial expression to the national (i.e. NDP) and provincial (i.e. OneCape 2040) development agendas;
- Serve as basis for coordinating, integrating and aligning 'on the ground' delivery of national and provincial departmental programmes;
- Support municipalities to fulfil their Municipal Planning mandate in line with the national and provincial agendas; and
- Communicate government's spatial development intentions to the private sector and civil society.

Embedded in these aims, the Western Cape's PSDF is based on a number of spatial principles that are required to guide developments, namely:
- Spatial justice;
- Sustainability and resilience;
- Spatial efficiency;
- Accessibility; and
- Quality and liveability.

The PSDF provides a basis for coordination, planning and implementation of government's spatial development intentions, and through its aims and guiding principles, the PSDF has essentially created a platform to ensure that the spatial principles are incorporated into development.

The Western Cape PSDF (2014)'s accessibility principles build on OneCape 2040's vision which identifies the provision of basic services to all households as a thematic 'big step' that needs to take place to achieve the PSDF's spatial agenda. Improving access to services is essential to achieving the settlement transitions identified by the National Development Plan and OneCape 2040. Further to this, the Western Cape PSDF (2014) notes that continual expansion of access to basic services to settlements is a key transition in order to achieve the other spatial principles, namely spatial justice, spatial efficiency (compaction), quality and liveability, as well as

sustainability and resilience. The transition, identified by the Western Cape Green Economy Strategic Framework (2013), is an important aspect to implement due to the rapid development and need for housing within the Bitou Local Municipality, as a result of the current housing backlog within the Local and District Municipality. The proposed development of a bulk water infrastructure is aligned with the accessibility principle as it will enable increased access to water services for existing human settlements and it will enable future low-cost housing development. The provision of infrastructure to service housing proposed for those on the housing backlog is important in order to alleviate past inequalities, ensure sustainable development, and for poverty alleviation. In this manner, the proposed development will contribute to addressing various socio-economic challenges facing the province.

The PSDF places emphasis on the importance on sustainability and resilience. Through the environmental assessment process that was followed, it is ensured that sustainable use of natural resources is well incorporated into to development of the project.

4.2	The Integrated Development Plan of the local municipality.

The Bitou Local Municipality Integrated Development Plan (IDP) 2017-2022 states the municipality's mission to be "We partner with communities and stakeholders to sustainably deliver quality services so that everyone in Bitou can live and prosper together". The IDP continues to outline the importance of sustainably services provision through the identified Key Performance Areas (KPA);

- KPA 3 Community and Social Development:
    - Objective 3.1: Eradicate poverty and uplift previously disadvantaged communities, promote social cohesion;

- KPA 4 Infrastructure Development:
    - Objective 4.1: Universal access to decent quality of services.

KPA's are identified to ensure that specific objectives are implemented to fulfil the needs of the people and the aims of the IDP. KPA 3 is quite direct by identifying the need to eradicate poverty and uplift communities as one of the main objectives. To achieve this objective, the IDP includes the SDF proposals in which the development of housing projects in Kurland is earmarked. In order for these housing developments to come to fruition, the local municipality's bulk infrastructure capacity needs to be increased. The provision of Bulk infrastructure will create a solid base for which poverty can be tackled. These aspects will allow for the upliftment of the existing communities, future communities and promote social cohesion.

KPA 4 identified by the Bitou municipality's IDP (2017) places emphasis on developing infrastructure with the objective of improving access to decent quality services. The expanded access to services is imperative for improving the liveability of settlements and functioning of communities. The provision of good quality services will ensure that access to those services remains uninterrupted and uncompromised. The proposed development will provide bulk water services infrastructure which will enable the municipal water reticulation system to meet existing demand in Kurland, and future demand of the proposed Kurland Housing Development. This increased bulk water service capacity will enable access for previously disadvantaged individuals to use water for housing and various other supportive uses. As this will be a new development, new infrastructure and modern-day technology will be utilized, this will improve the quality of the services provided by reducing maintenance required, ensuring optimum efficiency, and improving sustainability.

4.3.	The Spatial Development Framework of the local municipality.

The proposed development has been included in the Bitou Local Municipality Spatial Development Framework (MSDF) (2017), in terms of land use proposals. The Bitou MSDF notes various Land Development Objectives outlined to be achieved in order to ensure that projects planned meet the Local Municipalities Vision and Core Objectives.

The proposed development aligns with the Land Development Objective - The Provision of Infrastructure. The Local Municipality intends to drive this Objective by providing municipal infrastructure services to all developments in Urban Areas. When referring to the area of Kurland, the Land Development Objective and theme should relate to the expansion of the urban component, along with other sectors. Urban expansion should complement the existing low-income residential neighbourhood.

The Bitou Local Municipal SDF (2017) describes a number of core principles that are to be used to guide proposals, such as the proposed development. Of applicability to the proposed development, the Bitou MSDF notes the following principle:

- Ensure a base level of services is available for all residents in the Municipality including those households qualifying for indigent grants.

The proposed development of Bulk Infrastructure within Kurland will contribute to ensuring that a base level of services is available for all residents in the Municipality. According to the Bitou MSDF, citing the Bitou Municipality IDP (2017-2022) and Water Services Development Plan (2009), the proposed bulk water infrastructure project must be undertaken to meet rising demand and to upgrade and rehabilitate the municipality's existing water system. In this manner, the proposed development will enable spatially just urban expansion and ensure reliability of water services for existing neighbourhoods.

According to the Statistics South Africa 87,2% of Bitou Municipality households had access to water, as per the 2011 Census. The proposed development will enable the increased provision of water services to the existing Kurland Village, and it will enable the development of the future proposed Kurland Housing Development. Kurland Village is a "dormitory settlement housing industrial and farm workers, some 20kms from Plettenberg Bay. There are some employment opportunities within walking distance but generally levels of unemployment are high" (Bitou MSDF, 2017). The future proposed Kurland Housing Development is earmarked as a priority initiative to address the housing backlog of 4 049 in the municipality, with 432 in Kurland specifically (Bitou MSDF, 2017). As per the Kurland Draft SDF (see Figure 16), the future proposed Kurland Housing Development will encompass approximately 100 Breaking New Ground housing units (Bitou MSDF, 2017) which will require bulk infrastructure as proposed in the current project. The proposed development therefore creates an opportunity for a socially just society by providing an opportunity for past spatial and other development imbalances to be redressed through the improved access to and use of municipal services and land by disadvantaged communities.

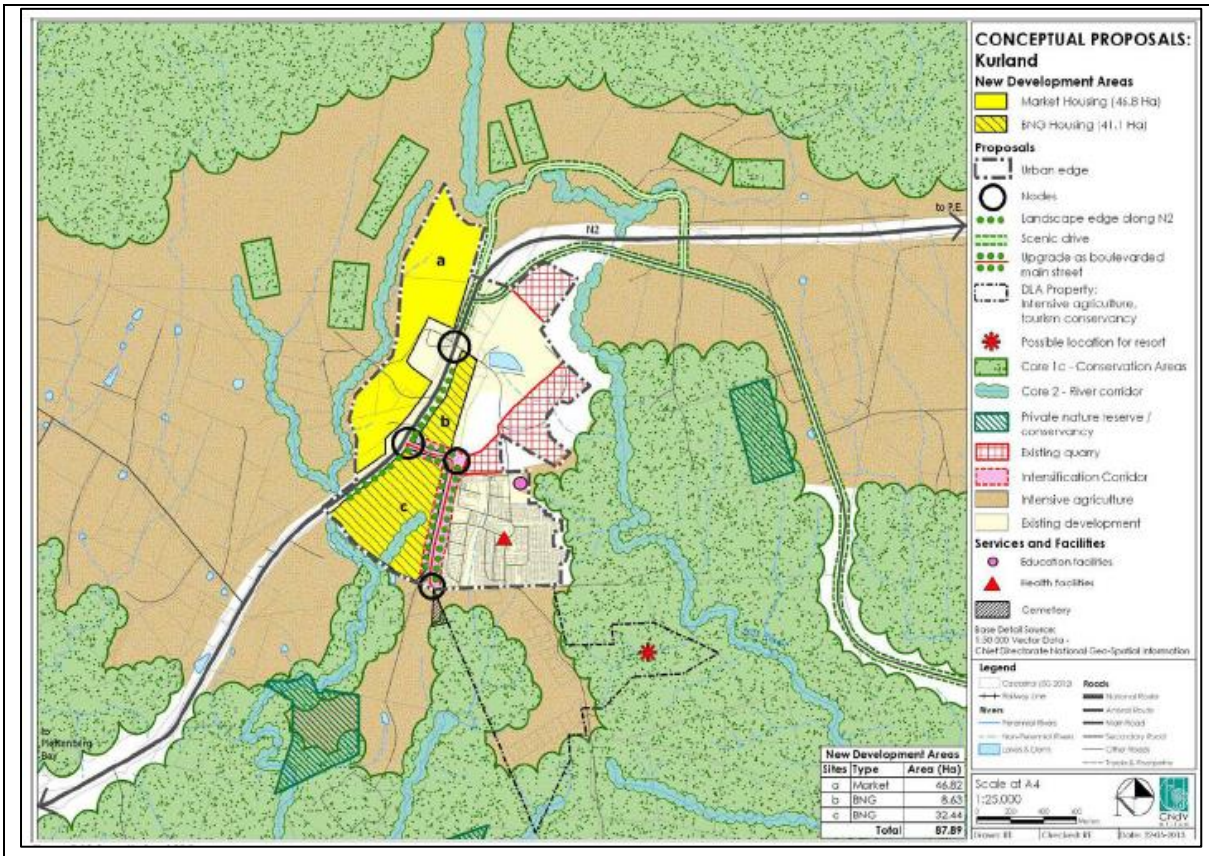


Figure 16: Draft SDF for Kurland (Bitou MSDF, 2017).

4.4.	The Environmental Management Framework applicable to the area.

The most recent EMF for the Garden Route provides general principles which bind all organs of state, including local authorities and their officials. The general principles are;

1. Disturbance of ecosystems and loss of biological diversity must be avoided or if that is not possible, minimised and remedied.
2. Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures.
3. The development, use and exploitation of renewable resources and the ecosystem of which they are part, must not exceed the level beyond which their integrity is jeopardised. This means that an ecosystem must not be disturbed to the point that its health and functioning breaks down.

These principles clearly outline the objective to reduce the impact on sensitive ecosystems. Each principle highlights the importance of preserving ecosystems that are sensitive and vulnerable by ensuring that resources are not exploited to an extent where the ecosystem can no longer function. Through the process to obtain Environmental Authorisation, various specialists were consulted to provide studies on environmental sensitivities which will inform the Environmental Authorisation decision making process. These specialist reports provide vital information to I&APs, authorities and stakeholders on the particular state of a proposed site with relation to the field investigated (Botanical, Aquatic etc.). This information in turn assisted the environmental assessment practitioner with identifying and understanding the extent of possible impacts. By doing this, sensitive environments will be identified and managed accordingly by incorporating and implementing no-go areas, buffer zones and mitigation measures throughout the project's lifespan.

5.	Explain how comments from the relevant authorities and/or specialist(s) with respect to biodiversity have influenced the proposed development.

Comments from relevant authorities and or specialists will be included after the 30-day Post-application Public Participation Process has been undertaken as prescribed in Section 19 of the NEMA EIA Regulations, 2014 (as amended 2017).

6.	Explain how the Western Cape Biodiversity Spatial Plan (including the guidelines in the handbook) has influenced the proposed development.

The influence of the Western Cape Biodiversity Spatial Plan on the proposed infrastructure will be addressed separately, based on the vast area to be covered.

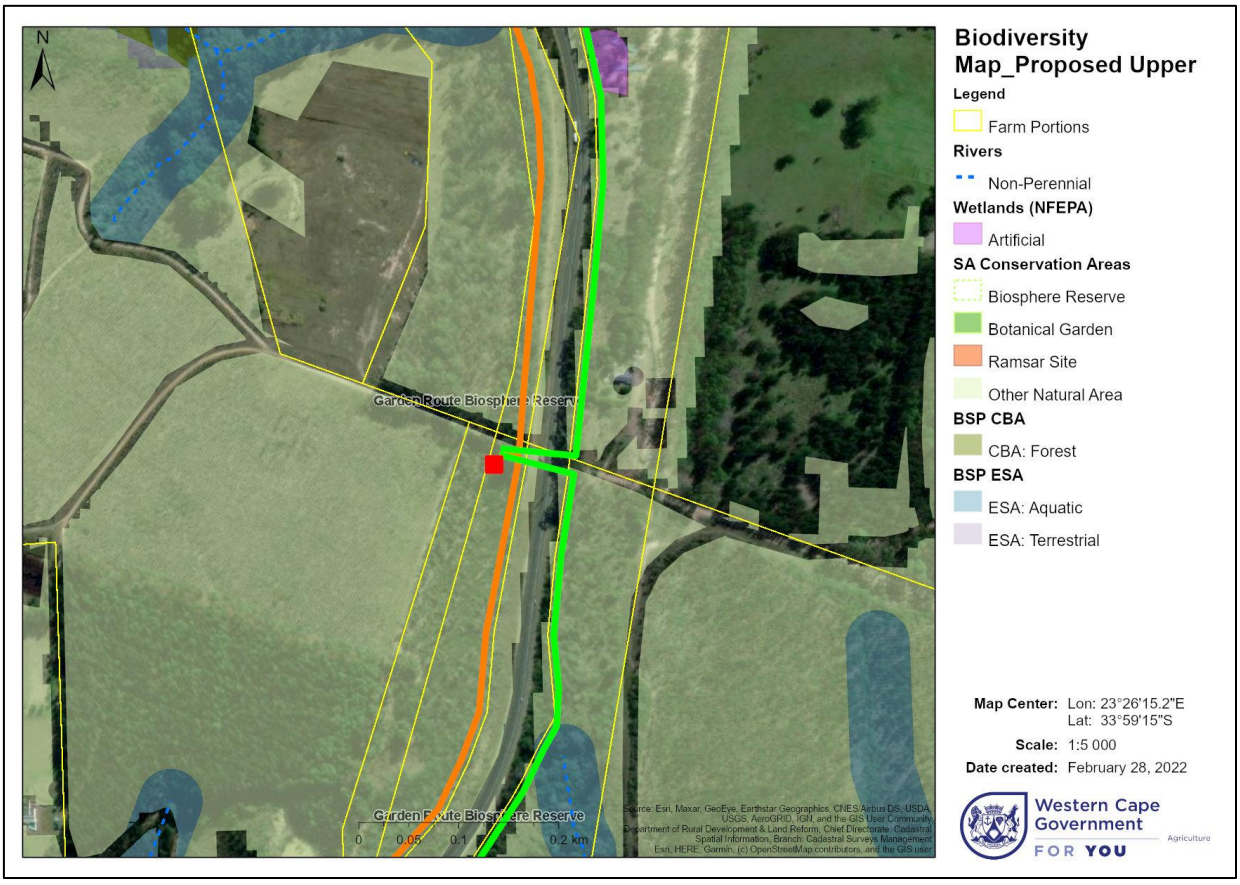


Figure 17: Proposed New 0.6ML Reservoir and Pump Station along proposed 200mm Bulk Water Rising Main (Preferred – Green & Alternative 2 – Orange) Pipeline - Biodiversity Map

The proposed 0.6ML reservoir and pump station is proposed to be located within RE/231 and 2/231. According to CapeFarmMapper, 2021, the site is located in an area designated as "Other Natural Area". The location is dominated by trees, and a plantation is located to the east of the site. An access road exists to the north of the site, off the N2.

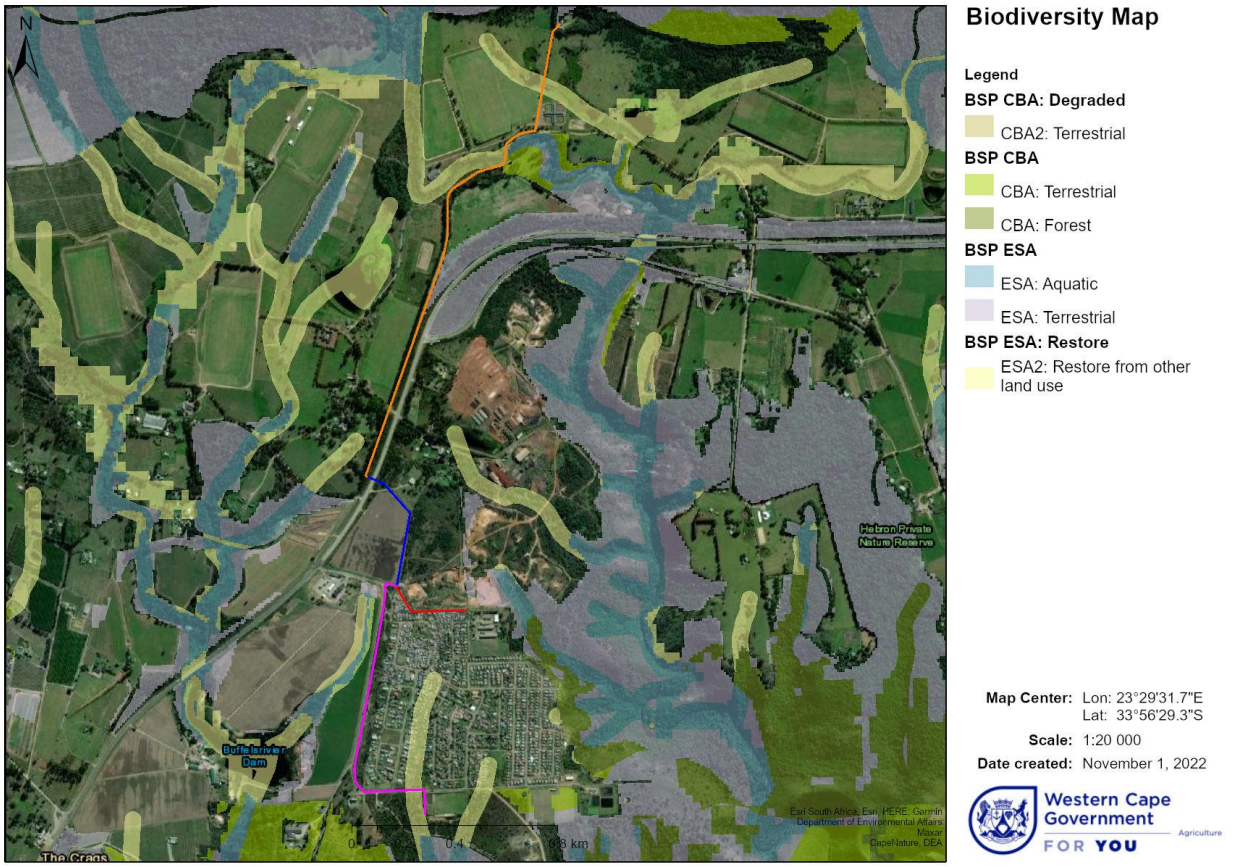


Figure 18: Biodiversity Map – (orange polyline indicates the 315mm Supply Pipeline to Kurland and 200mm Rising Main to Kurland WTW's, 2m's apart), 315mm Supply Pipeline(blue), 200mm Supply Pipeline to Kurland Township(red), 200mm Supply Pipeline to Kurland Housing 562 (pink).

The proposed upgrades to the Water Treatment Works in Kurland, will include the establishment of a 2ML Reservoir and boreholes. A Terrestrial ESA1 is identified to the north and west of the existing water works site, however this area will not be affected by the proposed development.

The proposed 315mm and 200mm Supply Pipeline will be positioned within the existing servitude, mostly adjacent to the road. Some areas in close proximity to the proposed site are classified as CBA1; ESA1 and ESA2. The 200mm Rising Main from the existing 160mm pipeline will be positioned 2m's away from the 315mm Supply Pipeline, and follow the same route as the 315mm, to the WTW's.

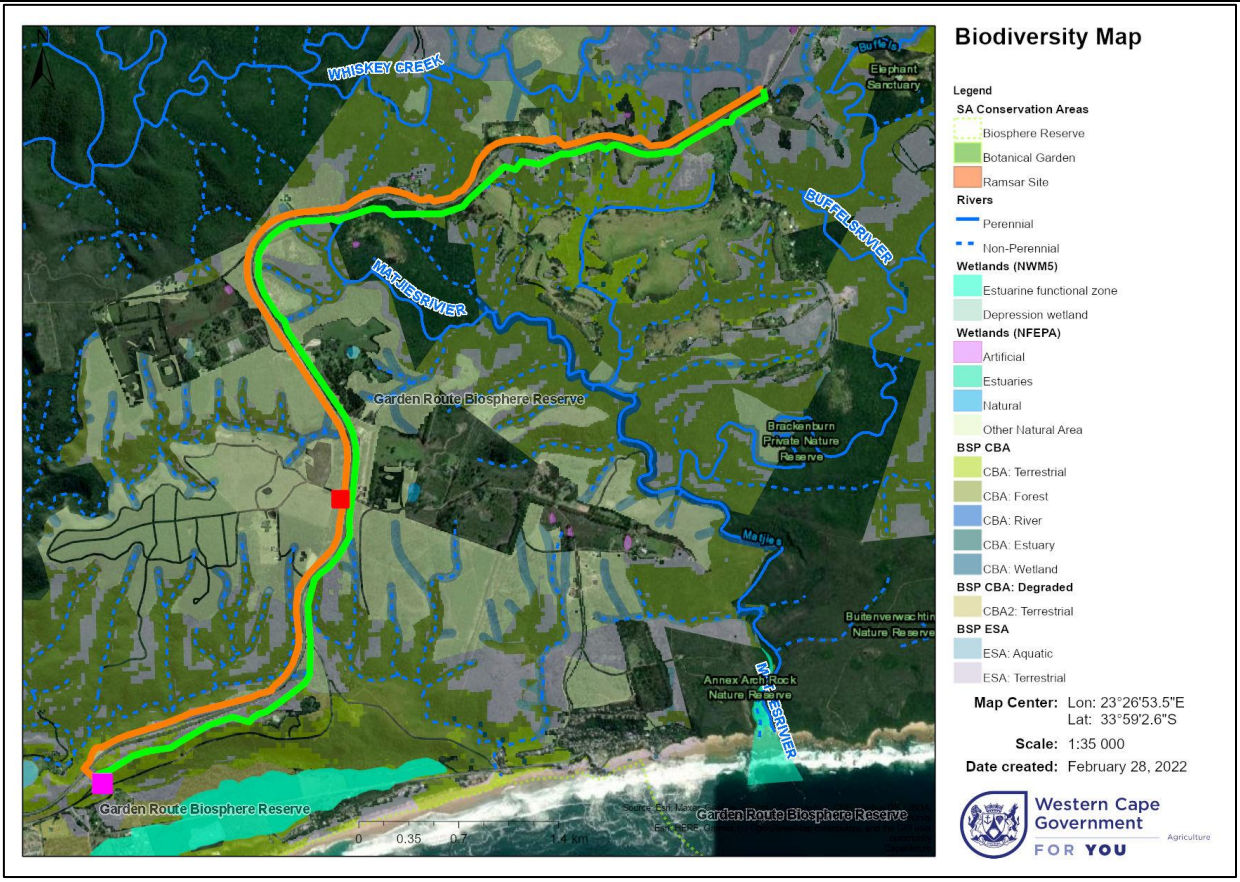


Figure 19: Proposed 200mm Water Rising Main Biodiversity Map

The proposed positioning of the 200mm pipeline will occur 6m within the 60m building line of the private properties. According to CapeFarmMapper the length of the pipeline occurs within a combination of: ESA1, ESA 2, Other Natural Areas and CBA 1.

In conclusion, the proposed bulk water infrastructure has the potential to directly or indirectly impact upon Other Natural Areas, a CBA1, an ESA1 and an ESA2. According to the Western Cape Spatial Biodiversity Plan, these areas are defined and recommended management is as follows:

"Other Natural Areas", are defined as areas that are not currently identified as a priority, but retain most of their natural character and perform a range of biodiversity and ecological infrastructure functions. Although not prioritised, they are still an important part of the natural ecosystem. The objective when managing areas such as this is to: minimize habitat and species loss and ensure ecosystem functionality through strategic landscape planning. Offers flexibility in permissible land-uses, but some authorisation may still be required for high-impact land-uses.

"CBA1 (Critical Biodiversity Areas)" are defined as areas in a natural condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure.

"ESA1 (Ecological Support Areas) Terrestrial/Aquatic" are defined as areas that are not essential for meeting biodiversity targets, but that play an important role in supporting the functioning of PAs or CBAs, and are often vital for delivering ecosystem services.

"ESA2: (Ecological Support Areas)" - Restore from other land use. These areas are defined as not essential for meeting biodiversity targets, but that play an important role in supporting the functioning of PAs or CBAs, and are often vital for delivering ecosystem services.

7.	Explain how the proposed development is in line with the intention/purpose of the relevant zones as defined in the ICMA.

The proposed upgrades to bulk water infrastructure do not occur in any coastal properties.

8.	Explain whether the screening report has changed from the one submitted together with the application form. The screening report must be attached as Appendix I.

The Application form has not been submitted.

9.	Explain how the proposed development will optimise vacant land available within an urban area.

The proposed development of bulk water infrastructure comprises of sub-surface pipelines which will make use of vacant land. The proposed Upper-Matjiesfontein Reservoir and Pump Station will be built on vacant municipal land. Overall, the proposed bulk infrastructure will optimise land within the urban edge by enabling the development of low-cost housing in Kurland through the future Kurland Housing Development which will be located within the urban edge.

10.	Explain how the proposed development will optimise the use of existing resources and infrastructure.

The proposed development will expand existing bulk water infrastructure and expand access to water resources. The proposed pump station at the Matjiesfontein Reservoir will be located within an existing servitude. The end point of the southern 200mm rising main proposed in the current project will tie-in with an existing rising main which will transport the water to the existing Kurland Water Treatment Works. The development, therefore, optimises existing infrastructure and servitudes where available.

11.	Explain whether the necessary services are available and whether the local authority has confirmed sufficient, spare, unallocated service capacity. (Confirmation of all services must be included in Appendix E16).

The provision of water services is not applicable to the operational phase of the proposed development as the purpose of the proposed development is to expand bulk water services capacity.

12.	In addition to the above, explain the need and desirability of the proposed activity or development in terms of this Department's guideline on Need and Desirability (March 2013) or the DEA's Integrated Environmental Management Guideline on Need and Desirability. This may be attached to this BAR as Appendix K.

The National Department of Environmental Affairs (2017) and the Western Cape Department of Environmental Affairs and Development Planning's (2011) environmental impact assessment Guidelines on Need and Desirability requires that the need and desirability of a project are considered and evaluated against the tenets of sustainability. This requires an analysis of the effect of the project on social, economic and ecological systems, and places emphasis on consideration of a project's justification in terms of the specific needs and interests of the community. The consideration of need and desirability in EIA decision-making, therefore, requires the consideration of the strategic context of the project along with broader societal needs and the public interest (DEA, 2017). This includes justification of a proposed development in terms of the current planning framework of the credible municipal Integrated Development Plan (IDP) and the Spatial Development Framework (SDF).

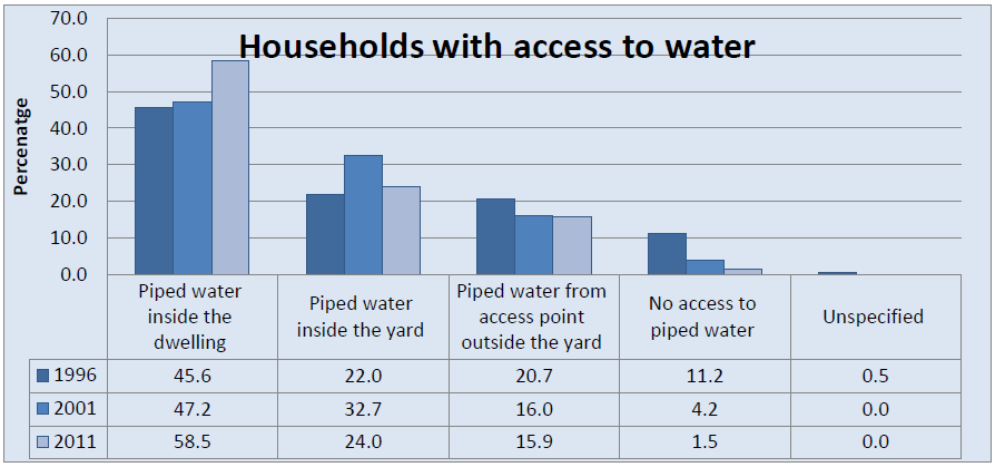
Social Aspects

The social component of need and desirability can be assessed using regional planning documents such as SDFs, IDPs and EMFs to assess the project's social compatibility with plans. These documents incorporate specific social objectives and emphasise the need to promote the social wellbeing, health, safety, and security of communities, especially underprivileged and/or vulnerable communities.

According to the Bitou Municipal IDP (2017), the "most critical development and internal transformation needs" include, inter alia:

- Water: No dams, limited water supply, lack of potable water.
- Infrastructure: Limited bulk infrastructure, landfill site needs, challenges with maintenance of Infrastructure
- Housing: Development of affordable (social and gap) housing.

The IDP further provides that 82.5% of households in the municipal area have access to piped water on their premises (see Figure 20). Ward 1, the ward in which Kurland and the proposed development are located, has the worst access to water statistics in the municipality; with a water backlog of more than 6% (see Figure 21). Added to the existing water demand, the municipality plans to develop 1500 affordable (social and gap) housing units as part of the future proposed Kurland Housing Development to alleviate the 8 800-unit housing backlog in the municipality (Bitou IDP, 2017). According to the engineering technical report by Lyners and Associates (2022), pipelines are designed for a 20-year period and the required capacity in 2043 is projected to be 2 930 Kℓ/day. The proposed development aims to meet the peak water demand as projected for 2043.



	Piped water inside the dwelling	Piped water inside the yard	Piped water from access point outside the yard	No access to piped water	Unspecified
1996	45.6	22.0	20.7	11.2	0.5
2001	47.2	32.7	16.0	4.2	0.0
2011	58.5	24.0	15.9	1.5	0.0

Figure 20: Percentage of Household who have Access to Potable Water (Bitou IDP, 2017).

Figure 21: Map Indicating Wards with Piped Water and Number of Households with No Access to Piped Water (Bitou IDP, 2017).

Therefore, the proposed development of bulk water infrastructure will enable the municipality to

address three of its most critical development needs (i.e. water access, bulk infrastructure, housing), and to meet the basic needs of housing and access to clean and safe water as enshrined by Sections 26 and 27 of the South African Constitution (1996). This will help ensure that the Bitou Local Municipality meets its mandate in terms of Chapter 7 of the Constitution (1996) and the Municipal Systems Act (Act 32 of 2000) to deliver basic municipal services to the Kurland community that are necessary to ensure acceptable and reasonable quality of life.

Economic Aspects

The economic need and desirability of a project can be assessed using national, provincial, district and local municipal planning documents to assess the project's economic compatibility with plans. These documents describe specific economic objectives and emphasise the need to:

- Improve job creation opportunities;
- Create opportunities for the private and public sectors to grow the economy;
- Ensure appropriate economic growth;
- Encourage trade and investment;
- Develop human capital and a skilled and capable workforce; and
- Provide adequate and appropriate infrastructure to stimulate economic growth.

The proposed project is aligned with the above objectives as it seeks to provide bulk water infrastructure which will enable economic growth in the community. The engineering technical report by Lyners and Associates (2022) estimates a total investment of R70 million for the proposed development to be completed. This will directly stimulate local economic growth.

According to the Bitou IDP (2017), unemployment in the municipality is very high amounting to more than 33% for the general population and approximately 38% for youth in 2011. It is further added that unemployment affects up to 80% of communities (Bitou IDP, 2017). The proposed development will generate multiple temporary and permanent opportunities during its construction and operation phase. Through providing bulk infrastructure, the development will indirectly stimulate investment and economic growth in the Kurland area, which will create indirect employment and economic opportunity.

Ecological aspects:

It is essential that the implementation of social and economic policies takes cognisance of strategic ecological concerns such as climate change, food security, as well as the sustainability in supply of natural resources and the status of our ecosystem services.

Sustainable development implies that a project should not compromise natural systems. In this regard, the Best Practicable Environmental Option (BPEO) is that which provides the most benefit and causes the least damage to the environment, at a cost acceptable to society, in the long term as well as in the short term.

Majority of the proposed infrastructure (pipelines) is subsurface; therefore, the ecological impacts are temporary, and the appointed Aquatic Biodiversity, Terrestrial Biodiversity, and Animal Species specialists concluded that the proposed development can be constructed within acceptable ecological impact limits provided that the recommended mitigation actions are adhered to.

In conclusion, the proposed project is justifiably needed and desirable in terms of the social, economic and ecological environments; and it is aligned with the spatial vision and strategic objectives of the Bitou Local Municipality.

National Framework for Sustainable Development ("NFSD")

In the National Framework for Sustainable Development ("NFSD") (2008), it states that "The achievement of sustainable development is not a once-off occurrence, and its objectives cannot be achieved by a single action or decision." As such, it is not expected that this proposed development will single handily achieve sustainable development, but it will contribute towards achieving sustainable development.

"The process to achieve sustainable development is an ongoing process that requires a particular set of values and attitudes in which economic, social and environmental assets that society has at its disposal, are managed in a manner that sustains human well-being without compromising the ability of future generations to meet their own need," (NFSD, 2008). The need and desirability of the proposed development is further emphasized as the proposed development forms part of the aforementioned on-going process. The proposed development conceptualizes the particular set of values and attitudes in which economic, social and ecological assets are required to be managed in order to sustain human well-being without compromising the ability of future generations to meet their own needs and effectively achieve sustainable development.

The Need and Desirability of the proposed development in terms of the Department's guideline on Need and Desirability (March 2013) is further emphasised through its alignment with the NEMA sustainability principles. Relevant specialist reports have been completed to aid decision making and fully understand all elements of the environment on site. As the specialist reports provide an insight into the environmental elements, provisions have been made for a stringent public participation process to take into account the interests, needs and values of all interested and affected parties. NEMA makes it evident that proposed developments must ensure that the environment and its resources must serve the public interest while protecting the ecological environment.

As described in **Table 5**, the proposed development will serve the public's social, economic and ecological needs equitably through its alignment with the sustainability principles provided in NEMA.

Table 5: Alignment of the proposed development with NEMA (1998) sustainable development principles

NEMA (1998) Section 2: Principles	Manner in which the principle is addressed by the proposed development
(2) Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably	The Environmental Assessment process underscoring this BAR, holistically considers the social, economic, and ecological needs of the local community, as well as the social, economic, and ecological consequences (disadvantages and benefits) of the proposed development and accordingly how the proposed development will contribute to meeting local needs as defined in the Bitou Municipal Integrated Development Plan and Municipal Spatial Development Framework (MSDF). As provided in the Bitou Muncipal IDP (2017), SDF (2017), and Water Services Development Plan (2020), the proposed development is required to meet the water services needs of the present population and the expected population growth and housing
(3) Development must be socially, environmentally, and economically sustainable.	

	development needs in Ward 1 of Bitou Municipality. At present there is water backlog of 6% in the ward and housing backlog of 8 800 houses. The proposed development will expand the capacity of the bulk water service infrastructure to enable the municipality to address the current water backlog and provide excess capacity to accommodate the future proposed Kurland Housing Development on Erf 562. Earmarked as a strategic development project by the IDP and Water Services Development Plan, the proposed development of bulk water infrastructure will enable the municipality to address three of its most critical development needs (i.e. water access, bulk infrastructure, housing), and it will enable the municipality to realise KPA 4 Objective 1: 'Universal access to decent quality of services'. In line with KPA 4, the proposed development of bulk water services in Kurland, Ward 1, is earmarked as strategic development project in the current Bitou IDP 2017-2022 (2017). In this manner, the proposed development forefronts people and their needs in a manner which is socially, economically and ecologically sustainable.
(4) – *(a)* Sustainable development requires the consideration of all relevant factors including the following:	
(i) That the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied;	Majority of the proposed infrastructure (pipelines) is subsurface; therefore, the ecological impacts are temporary. The appointed Aquatic Biodiversity, Terrestrial Biodiversity, and Animal Species specialists concluded that the proposed development can be constructed within acceptable ecological impact limits provided that the recommended mitigation actions are adhered to.
(ii) that pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;	Mitigation measures as provided by the Aquatic Biodiversity, Terrestrial Biodiversity, Agriculture, and Animal Species specialists will be included in the mitigation tables of the BAR and translated into the EMPr for implementation on site. Applicable safety measures and controls, as well as registration conditions (where applicable), have been considered throughout this BAR and will be translated into the EMPr for implementation and compliance on site during pre-construction, construction, post-construction, and operation of the

	proposed development. This will ensure that pollution and degradation of the environment are avoided, or where they cannot be altogether avoided, are minimised and remedied.
(iii) that the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied;	In terms of Section 38(1)(a) of the National Heritage Resources Act (Act 25 of 1999), a Notice of Intent to Develop (NID) must be submitted to the provincial heritage authority for a "development categorised as (a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length". The proposed development will constitute approximately 13 000m of pipeline. Therefore, a NID was compiled by Dr Jayson Orton, for submission to Heritage Western Cape. The NID concluded that given that the proposed work is mostly subsurface with the above ground components generally not in public view, there are no visual/landscape concerns, and archaeological and palaeontological impacts are unlikely.
(iv) that waste is avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner;	The proposed site and associated development will be managed in accordance with the Bitou Waste Management By-law (year) and the Garden Route District Waste Management By-law (2017). Waste management measures as part of an integrated waste management system will be including in the EMPr (Appendix H). The system must be based on waste minimisation and must incorporate reduction, recycling, re-use and appropriate disposal. Separate waste bins/skips must be provided for recyclable waste, general waste and builders' rubble/construction waste. These bins/skips must be emptied, and the waste taken to a registered disposal facility – the receipts of which must be kept on file for inspection.
(v) that the use and exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resource; (vi) that the development, use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised;	The main raw water supply to the Kurland area is from the Wit River abstraction point. The abstraction from the Wit River is not exceptionally reliable since the delivery of 600 kℓ/day reduces drastically during dry periods. Back-up/supplementary sources are, therefore, important to provide sustainable supply. The proposed development will supplement the water supply with water from the existing Matjiesfontein reservoir and the proposed four new boreholes within the Kurland WTW yard. As reported in the engineering "Technical Report for Upgrading of Kurland Water Sources, Water

	Treatment Works, Reservoir and Bulk Supply Pipelines", dated October 2022. Neil Lyners & Associates (RF)(Pty) Ltd Groundwater Africa was appointed by Neil Lyners and Associates (RF) (Pty) Ltd to investigate groundwater as a water source option to augment supplies to Kurland Village for the Bitou Municipality. An initial target of 5 – 10 L/s is required for the first phase of a proposed housing development. The target will be reached with the current equipping of the four (4) boreholes within the WTW yard. Should ~25 L/s be available from groundwater sources then it may not be necessary to install a pipeline from the Matjiesfontein Reservoir the third phase of the Erf 562 development. Kurland is located on the widely used Table Mountain Group (TMG) aquifer system, and there is a slight possibility of obtaining the targeted 25 L/s within a ~5 km radius of the village's Water Treatment Works (WTW). Several boreholes would be required, and in some areas, it may be necessary to treat for iron and manganese. Due to the fact that these borehole sites are located on private properties and the water will need extensive treatment the potential of additional groundwater is not seen as a viable immediate option to augment the future water supply. Potential drill sites and further detail regarding the ground water exploration is included under Annexure C1 & Annexure C2.
(vii) that a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions; and	Extensive analysis from various perspectives, both environmental, technical, and planning has been invested in the proposal. The overall BAR integrates all this data, so as to inform the decision-making process going forward. The various specialists assessments took into the potential consequences of the proposed development (disturbance, pollution, degradation, waste) and provided mitigation measures integrated into the EMPr for implementation on site pre-construction, during and post-construction (Appendix H).
(viii) that negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.	Guided by applicable specialist assessments, potential negative environmental impacts and respective mitigation measures have been addressed and integrated in the BAR and EMPr (Appendix H).
(b) Environmental management must be integrated, acknowledging that	The Environmental Assessment process underscoring this BAR, holistically considers the social, economic,

all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option	and ecological impacts (disadvantages and benefits) of the proposed development and provides mitigation measures for possible negative impacts. Provision has been made for a stringent 30-day public participation process to take into account the interests, needs and values of all interested and affected parties.
(c) Environmental justice must be pursued so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons	To safeguard against the unjust distribution of adverse environmental impacts, and as advised by the appointed specialists, mitigation measures are included in the mitigation tables of this BAR (Section F) which are translated into the EMPr (Appendix H). In addition, no person, particularly vulnerable and disadvantaged persons, were found to be directly affected by the proposal, or site development in a negative manner. However, persons of this nature may benefit, through increased access to water services and socio-economic benefits that will be created by the proposed development. The additional water services capacity provided by the proposed development will benefit previously disadvantaged persons as it will provide the water services capacity to supply the future proposed Kurland Housing Development.
(d) Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human well-being must be pursued and special measures may be taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination	Ward 1, the ward in which Kurland and the proposed development are located, has the worst access to water statistics in the municipality; with a more than 6% water backlog. Added to the existing water demand, the municipality plans to develop 1500 affordable (social and gap) housing units as part of the future proposed Kurland Housing Development to alleviate the 8 800-unit housing backlog in the municipality (Bitou IDP, 2017). Therefore, the proposed development of bulk water infrastructure, as set out in Bitou Municipal Water Services Development Plan (2020), will enable the municipality to address three of its most critical development needs (i.e. water access, bulk infrastructure, housing), and to meet the basic needs of housing and access to clean and safe water as enshrined by Sections 26 and 27 of the South African Constitution (1996). This will help ensure that the Bitou Local Municipality meets its mandate in terms of Chapter 7 of the Constitution (1996) and the Municipal Systems Act (Act 32 of 2000) to deliver basic municipal services to the Kurland community that are necessary to ensure acceptable and reasonable quality of life.

(e) Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle	Temporary nuisances may arise during the construction phase of the development; however, mitigation has been integrated into the EMPr to reduce the significance of the impacts, and they are not predicted to extend into operational phase. In accordance with the below legislation, mitigation measures to ensure that environmental health and safety is maintained are provided in the EMPr for implementation during the operational phase of the development: – Water Services Act (Act 108 Of 1997), As Amended 2005 – National Norms and Standards For Domestic Water And Sanitation Services (Gn. 982 Of 2017) – National Water Act (Act 36 Of 1997) – Bitou Water Supply, Sanitation Services and Industrial Waste By-Law (2009) – Bitou Municipality Water Services Development Plan (2020) – Bitou Roads And Streets By-Law (2009) – Bitou Solid Waste Disposal By-Law (Year) – Eden (Garden Route) District Municipality Waste Management By-Law (2017) During the development process, multiple jobs will be created and opportunity for skills transfer and knowledge sharing will be supported. This will equip labour with skills and experience that will aid in securing future employment, which will lead to livelihood improvement and economic upliftment.
(f) The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation, and participation by vulnerable and disadvantaged persons must be ensured.	Provisions have been made for a stringent public participation process in order to take into account the interests, needs and values of all interested and affected parties. Public participation measures include placing a notice board at the proposed site, placing an advertisement in a local newspaper, providing environmental assessment documents to registered interested and affected parties, adjacent property owners, relevant organs of state and providing access to these documents on the EAP's website and in hardcopy form at a local public library.
(g) Decisions must take into account the interests, needs and values of all interested and affected parties, and this includes recognising all forms of knowledge, including traditional and ordinary knowledge.	Provisions have been made for a stringent public participation process in order to take into account the interests, needs and values of all interested and affected parties.
(h) Community wellbeing and empowerment must be promoted	According to the Bitou IDP (2017), the unemployment rate in the municipality is ~30%. The proposed

through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means.	development will provide socio-economic benefits to the local community. During the construction and operation phases, multiple temporary and permanent jobs will be created and opportunity for skills transfer and knowledge sharing will be supported. This will equip labour with skills and experience that will aid in securing future employment. These skills and knowledge can also be passed on to younger generations, creating a virtuous cycle of skills development, livelihood improvement and economic upliftment.
(i) The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.	This BAR holistically considers the social, economic, and ecological impacts (disadvantages and benefits) of the proposed development and provides mitigation measures for possible negative impacts. These mitigation measures are translated through to the EMPr to guide decision-making and promote monitoring and corrective action during the planning, pre-construction, construction and operational phases of the development (Appendix H).
(j) The right of workers to refuse work that is harmful to human health or the environment and to be informed of dangers must be respected and protected.	During the construction and operational phases, the Occupational Health and Safety Act (85 of 1993) will be implemented by an appropriate professional on site, to ensure the health and safety of workers.
(k) Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law.	Undertaking the Basic Assessment process allows for accountability and transparency of the proposed development in an integrated manner, as the documents will be submitted for public participation, to any interested and affected party, and will be subject to comments, rejections and appeals, in accordance with section 41 of the NEMA EIA Regulations (2014, as amended). Information, reports and documentation will be made available to I&APs via the SES website for download, review and comment. The SEScc website is designed to be mobile friendly, allowing those with only mobile internet the availability to view the relevant reports. On request, reports would also be shared via bulk online sharing sites such as WeTransfer, and in hard-copy form through individual deliveries or in a local public library. In accordance with Section 4(1) of the NEMA EIA Regulations (2014, as amended), upon reaching a decision on whether to grant an Environmental Authorisation for the proposed development, the competent authority must provide the applicant with the decision, with accompanying reasons for the decision, and inform the applicant that such decision

	can be appealed. Further to this, in terms of Section 4(2) the applicant must within 14 days of the date of the decision provide I&APs with access to the decision and reasons for such decision, and that such decision may be appealed. These regulations, and compliance therewith, ensure that decisions are taken in an open and transparent manner, and access to information is provided.
(l) There must be intergovernmental co-ordination and harmonisation of policies, legislation and actions relating to the environment.	The proponent has taken all necessary measures to comply with the requirements of relevant policies, legislation, and the relevant organs of state have been included as I&APs to provide comment during the public participation process.
(m) Actual or potential conflicts of interest between organs of state should be resolved through conflict resolution procedures.	No conflicts were encountered, however, should any arise, they will be addressed appropriately
(n) Global and international responsibilities relating to the environment must be discharged in the national interest.	The proposed development aligns with the relevant national legislation which as promulgated by the relevant domestic legislatures gives effect to international environmental responsibilities.
(o) The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage.	In terms of Section 38(1)(a) of the National Heritage Resources Act (Act 25 of 1999), a Notice of Intent to Develop (NID) must be submitted to the provincial heritage authority for a "development categorised as (a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length". The proposed development will constitute approximately 13 000m of pipeline. Therefore, a NID was compiled by Dr Jayson Orton, for submission to Heritage Western Cape. The NID concluded that given that the proposed work is mostly subsurface with the above ground components generally not in public view, there are no visual/landscape concerns, and archaeological and palaeontological impacts are unlikely.
(p) The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.	As advised by the appointed specialists, mitigation measures are included in the mitigation tables of this BAR (Section F) which are translated into the EMPr (Appendix H), the developer does take responsibility for the implementation of and compliance with these aspects.
(q) The vital role of women and youth in environmental management and	During the development process, multiple jobs will be created and opportunity for skills transfer and

development must be recognised and their full participation therein must be promoted.	knowledge sharing will be supported. This will equip labour with skills and experience that will aid in securing future employment. These skills and knowledge can also be passed on to younger generations, creating a virtuous cycle of skills development, livelihood improvement and economic upliftment. Labour will include female labour and the process of appointment will not discriminate against any person based on gender.
(r) Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.	Majority of the proposed infrastructure (pipelines) is subsurface; therefore, the ecological impacts are temporary. The appointed Aquatic Biodiversity, Terrestrial Biodiversity, and Animal Species specialists concluded that the proposed development can be constructed within acceptable ecological impact limits provided that the recommended mitigation actions are adhered to.

SECTION F: PUBLIC PARTICIPATION

The Public Participation Process ("PPP") must fulfil the requirements as outlined in the NEMA EIA Regulations and must be attached as Appendix F. Please note that If the NEM: WA and/or the NEM: AQA is applicable to the proposed development, an advertisement must be placed in at least two newspapers.

1. Exclusively for linear activities: Indicate what PPP was agreed to by the competent authority. Include proof of this agreement in Appendix E22.

The following public participation plan will be implemented:

Public participation requirements in terms of the 2014 EIA Regulations (as amended 2017)	Proposed implementation
41(2)(a) fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of— (i) the site where the activity to which the application or proposed application relates is or is to be undertaken; and (ii) any alternative site; **41(3)** A notice, notice board or advertisement referred to in subregulation (2) must— **(a)** give details of the application or proposed application which is subjected to public participation; and **(b)** state— (i) whether basic assessment or S&EIR procedures are being applied to the application; (ii) the nature and location of the activity to which the application relates; (iii) where further information on the application or proposed application can be obtained; and (iv) the manner in which and the person to whom representations in respect of the application or proposed application may be made. **41(4)** A notice board referred to in subregulation (2) must— **(a)** be of a size of at least 60cm by 42cm; and **(b)** display the required information in lettering and in a format as may be determined by the competent authority.	As per Figure 22, a notice board meeting the requirements will be fixed at six locations along the corridor of the proposed development. These locations include at the start, midpoint and end of each pipeline, including at the proposed site for the new Upper Matjiesfontein Reservoir and Pump Station (see Figure 22).
41(2)(b) giving written notice, in any of the manners provided for in section 47D of the Act, to— (i) the occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken; (ii) owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken; (iii) the municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area; (iv) the municipality which has jurisdiction in the area; (v) any organ of state having jurisdiction in respect of any aspect of the activity; and (vi) any other party as required by the competent	An I&AP register has been compiled, which identifies affected adjacent landowners, authorities, organs of state and other affected parties. A summary of the means proposed to notify the various I&APs has been included in the section below. These include email notification, direct telephonic calls, Whatsapp Broadcasts, letter drops, site notices and newspaper advertisement. Letter-drops will be undertaken as per Section 3.2, below.

2. Confirm that the PPP as indicated in the application form has been complied with. All the PPP must be included in Appendix F.

State Department / Organ of State	***Contact Person***	***Contact Details***
DEADP: Development Management Region 3	Ms J Christie	Jessica.Christie@ westerncape.gov.za;
	Admin	DEADPEIAAdmin.George@westerncape.gov.za
DEA&DP: Pollution Management	Mr A McClelland	arabel.mcclelland@ westerncape.gov.za
Breede-Gouritz CMA	Mr C Abrahams	cabrahams@bgcma.co.za
CapeNature: Land use – Landscape Easte	Mr C Fordham	cfordham@capenature.co.za
	Ms M Simons	msimons@capenature.co.za
Heritage Western Cape	Ms S Barnardt	Stephanie.Barnardt@westerncape.gov.za
Bitou Local Municipality	Mr F Stuurmen	fstuurman@plett.gov.za
WCG: Department of Forestry	Ms M Koen	Mkoen@environment.gov.za
WCG: Department of Agriculture	Mr C van der Walt	corvdw@elsenburg.com
	Mr B Laymen	brandonl@elsenburg.com
WCG: Transport and Public Works	Mr X Smuts	xander.smuts@westerncape.gov.za
	Dr H Wolff	herman.wolff@westerncape.gov.za
Department of Rural Development & Land Reform	Mr T Bolton	Tommie.Bolton@drdlr.gov.za
Eskom: Land Development	Mr O Peters	PetersOw@eskom.co.za
South African Civil Aviation Authority	Ms L Stroh	strohL@caa.co.za
	Ms E Shogola	ShogoleE@caa.co.za
Garden Route District Municipality Executive Manager: Community Services	Ms. C Africa	cafrica@gardenroute.gov.za

Garden Route District Municipality Executive Manager: Planning and Economic Development	Mr L Menze	info@gardenroute.gov.za
Garden Route District Municipality: Health and Environmental Services	Mr J Compion	jcompion@gardenroute.gov.za
Garden Route District Municipality Executive Manager: Roads Services	Mr J.G Daniels	info@gardenroute.gov.za
Garden Route District Municipality: District Waste Management	Mr M Hubbe	morton@edendm.co.za
Bitou Municipality: Municipal Manager	Mr M Memani	mmemani@plett.gov.za
Bitou Local Municipality: Parks & Recreation	Mr J Basson	jbasson@plett.gov.za
Bitou Municipality: Community Services	Mr M Sompani	smadokwe@plett.go.za
Bitou Municipality - Town Planning	Ms A Stander	astander@plett.gov.za
	Mr J Basson	jbasson@plett.gov.za
	Mr C Schliemann	cschliemann@plett.gov.za
Bitou Municipality : Environmental Management Officer	Ms A Taljaard	ataljaard@plett.gov.za
Bitou Municipality : Waste Management	Mr R Bower	rbower@plett.gov.za

Officer		
Bitou Municipality: Water and Sanitation Services	F Samuel	fsamuel@plett.gov.za
Bitou Municipality: Strategic Services Department	Mr L Gericke (Director)	lgericke@plett.gov.za
	Ms R Brakfesi (PA)	rbrakfesi@plett.gov.za
Bitou Municipality: Strategic Services Department - Local Economic Development	L Jacobs (Manager)	ljacobs@plett.gov.za
	J Lottering (Community Development & Business Support)	jlottering@plett.gov.za
Bitou Municipality: Strategic Services Department - Building Control	C Basson	cbasson@plett.gov.za
Bitou Municipality: Integrated Development Planning	T Henge	thenge@plett.gov.za
Bitou Municipality: Public Safety	A Sakati	asakati@plett.gov.za
	N Dlamini	ndlamini@plett.gov.za
Bitou Municipality: Fire and Rescue Services	H Venter	hventer@plett.gov.za
Bitou Municipality: Roads and Stormwater	Mr P Dietzsch	dietzsch@plett.gov.za
Ward Councillor - Ward 1	Councillor J.N Kamkam	jkamkam@plett.gov.za
Kurland Public Library	Ms E Willemse	ewillemse@plett.gov.za
	Mr SX Tokota (Library Assistant)	stokota@plett.gov.za

3. Confirm which of the State Departments and Organs of State indicated in the Notice of Intent/application form were consulted with.

Proof of notification will be included in the Post Application Draft BAR.

4. If any of the State Departments and Organs of State were not consulted, indicate which and why.

Proof of public participation will be included in the Post Application Draft BAR.

5. if any of the State Departments and Organs of State did not respond, indicate which.

Proof of public participation will be included in the Post Application Draft BAR.

6. Provide a summary of the issues raised by I&APs and an indication of the manner in which the issues were incorporated into the development proposal.

A summary will be provided after public participation.

Note:

A register of all the I&AP's notified, including the Organs of State, and all the registered I&APs must be included in Appendix F. The register must be maintained and made available to any person requesting access to the register in writing.

The EAP must notify I&AP's that all information submitted by I&AP's becomes public information.

Your attention is drawn to Regulation 40 (3) of the NEMA EIA Regulations which states that *"Potential or registered interested and affected parties, including the competent authority, may be provided with an opportunity to comment on reports and plans contemplated in subregulation (1) prior to submission of an application but **must** be provided with an opportunity to comment on such reports once an application has been submitted to the competent authority."*

All the comments received from I&APs on the pre -application BAR (if applicable and the draft BAR must be recorded, responded to and included in the Comments and Responses Report and must be included in Appendix F.

All information obtained during the PPP (the minutes of any meetings held by the EAP with I&APs and other role players wherein the views of the participants are recorded) and must be included in Appendix F.

Please note that proof of the PPP conducted must be included in Appendix F. In terms of the required "proof" the following is required:

- a site map showing where the site notice was displayed, dated photographs showing the notice displayed on site and a copy of the text displayed on the notice;
- in terms of the written notices given, a copy of the written notice sent, as well as:
  - if registered mail was sent, a list of the registered mail sent (showing the registered mail number, the name of the person the mail was sent to, the address of the person and the date the registered mail was sent);
  - if normal mail was sent, a list of the mail sent (showing the name of the person the mail was sent to, the address of the person, the date the mail was sent, and the signature of the post office worker or the post office stamp indicating that the letter was sent);
  - if a facsimile was sent, a copy of the facsimile Report;
  - if an electronic mail was sent, a copy of the electronic mail sent; and
  - if a "mail drop" was done, a signed register of "mail drops" received (showing the name of the person the notice was handed to, the address of the person, the date, and the signature of the person); and
- a copy of the newspaper advertisement ("newspaper clipping") that was placed, indicating the name of the newspaper and date of publication (of such quality that the wording in the advertisement is legible).

SECTION G: DESCRIPTION OF THE RECEIVING ENVIRONMENT

All specialist studies must be attached as Appendix G.

1. Groundwater

1.1.	Was a specialist study conducted?	YES	**NO**
1.2.	Provide the name and or company who conducted the specialist study.		
None.			

1.3.	Indicate above which aquifer your proposed development will be located and explain how this has influenced your proposed development.

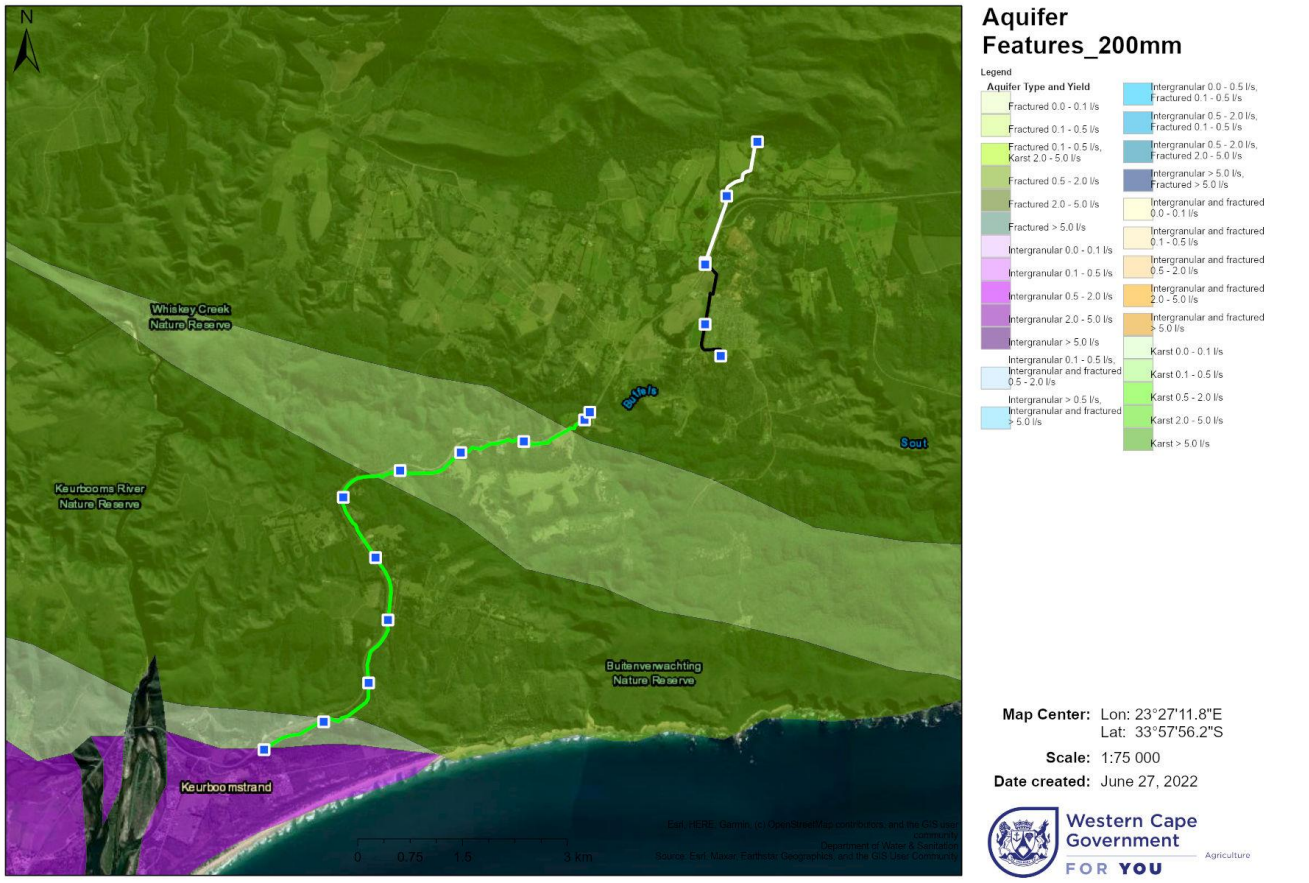


Figure 23: Aquifer details (CapeFarmMapper, 2022)

According to CapeFarmMapper the proposed UPVC 200mm Rising Main route, is underlain by an intergranular aquifer (purple) at the existing Matjiesfontein Reservoir (portion of Section Ref#1), and fractured aquifers of various yields throughout the rest of the route. The northern section of the 200mm Rising Main, 315mm and 200mm supply pipelines are underlain by a fractured aquifer.

An Intergranular aquifer is an aquifer in which groundwater flows in openings and void space between grains or weathered rock. While a fractured aquifer is a formation that contains sufficient fissures, fractures, cracks, joints and faults that yields economic quantities of water to boreholes and springs (DWS-Groundwater Dictionary*[1]).

According to CapeFarmMapper all the aquifers (both intergranular and fractured) characteristics are similar in nature, and are classified as follows:

- Classification: Major
- Susceptibility: Medium
- Vulnerability: Moderate

UPVC pipes are to be utilized. UPVC or Unplasticized Polyvinyl Chloride, have the following benefits, as extracted from LCETED, 2022*[2]:

- Lead-free pipe: uPVC pipes and fittings are lead-free and suitable for drinking water.
- Strong and lightweight: UPVC pipes have strong elasticity and are very light in weight, which makes them very easy to handle and install. What many people do not know is that uPVC pipes are stronger than ordinary PVC pipes. uPVC pipes help to experience higher pressure bearing capacity than ordinary PVC pipes.
- Installation Easy: This greatly reduces labour and installation costs. Because uPVC pipes are relatively lighter than steel pipes, they have lower transport costs and are easier to install. Solvent cement can be used to form joints in plain pipes, threaded pipes do not require solvent cement. The connection process of uPVC pipes and fittings is done quickly and easily using inexpensive tools.
- Non-toxic and odourless: they are not affected by fungi or bacteria. They are eco-friendly and made of virgin un-plasticized polyvinyl composites. Also, they are maintenance-free and these pipes are suitable for all types of cold water pipe operations in residential and commercial

1.4.	Indicate the depth of groundwater and explain how the depth of groundwater and type of aquifer (if present) has influenced your proposed development.

As indicated in Figure 23, the characteristics related to the aquifer type and depth to groundwater, extracted from CapeFarmMapper is tabled below (Table 6)

Table 6: Aquifer characteristics.

Proposed Pipeline	**Section Ref#**	**Underlain Aquifer Type**	**Approximate Yield**	**Depth to Groundwater (mbgl)**
Proposed Rising Main (200mm) the Existing Tie-In	1	Intergranular	0.5 - 2.0 l/s	Approximately 50.10
		Fractured	0.0 - 0.1 l/s	
	2		0.5 - 2.0 l/s	
	3			
	4			
	5			
	6			
			0.1 - 0.5 l/s	Approximately 48.95
	7			
	8			
	9		0.5 - 2.0 l/s	
	10			
Proposed 315mm Pipeline to Kurland & 200mm Rising Main	11			
	12			
	12.1			
Proposed 200mm Pipeline to Kurland Township & Housing 562	13			
	14			

Considering the depth to groundwater is more than 40m's, and the maximum depth of the pipeline is maximum 2m's (where necessary), the average trench of 1,2m depth, maximum 2m's. The proposed development will not influence the aquifers present, and vice versa.

2. Surface water

2.1.	Was a specialist study conducted?	**YES**	NO
2.2.	Provide the name and/or company who conducted the specialist study.		

FEN Consulting

Report author: C. Grainger (Cand.Sci.Nat)
Report reviewers: C. du Preez (Pr. Sci. Nat) & K. Marias (Pr.Sci.Nat)

2.3.	Explain how the presence of watercourse(s) and/or wetlands on the property(ies) has influenced your proposed development.

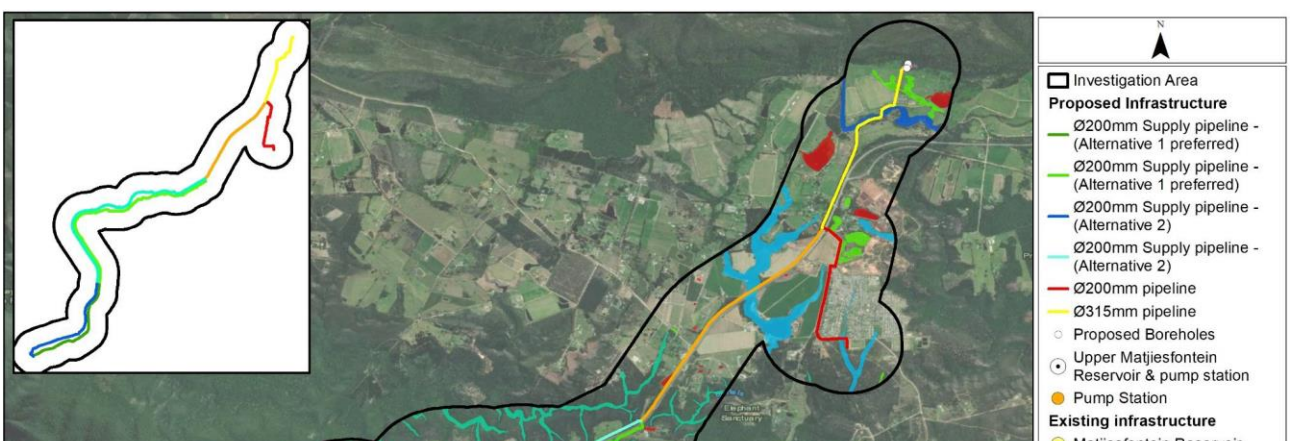
According to the Freshwater Assessment for the Proposed Bulk Water Pipeline Infrastructure, Kurland, Bitou Municipality, April 2022. The following watercourses were identified along the proposed route:

Table 7: Watercourse features identified.

Watercourse	Level 3: Landscape Unit	Level 4: Hydrogeomorphic (HGM) Type
Hillslope Seep	Slope: an inclined stretch of ground typically located on the side of a mountain, hill or valley, not forming part of a valley floor. Includes scarp slopes, mid-slopes and foot-slopes.	A wetland area located on gently to steeply sloping land and dominated by colluvial (i.e. gravity-driven), unidirectional movement of water and material down-slope. Seeps are often located on the side-slopes of a valley but they do not, typically, extend onto a valley floor.
Unchanneled Valley Bottom Wetland	Valley Floor: the base of a valley, situated between two distinct valley side-slopes, where alluvial or fluvial processes typically dominate.	A valley-bottom wetland without a river channel running through it and is instead characterised by diffuse flows that are covered by the establishment of facultative vegetation across the lateral extent of the valley floor.
Hol River		A linear landform with clearly discernible bed and banks which permanently or periodically carries a concentrated flow of water.Rivers and drainage lines may or may not have distinct riparian zones.
Ephemeral drainage lines	Slope: an inclined stretch of ground typically located on the side of a mountain, hill or valley, not forming part of a valley floor. Includes scarp slope, mid-slopes and foot-slopes.	

Table 8: Summary of results of the field assessment as per Specialist input.

Watercourse	Present Ecological State (PES)	Ecoservices	Ecological Importance and Sensitivity (EIS)	Recommended Ecological Category (REC), Recommended Management Objective (RMO) and Best Attainable State (BAS)
Hillslope seep	Category C (Moderately Modified)	Low to Moderately Low	High	REC Category: C (Moderately modified) BAS: Category: C RMO Category: Improve
Unchanneled valley bottom wetlan	Category D (Largely modified)	Low	High	REC Category: D (Largely modified) BAS: Category: D RMO Category: (Improve)
Hol River	Category C (Moderately Modified)	Low to Moderate	High	REC Category: C (Moderately modified) BAS: Category: C RMO Category: Improve
Ephemeral drainage lines	Category C (Moderately modified)	Low	High	REC Category: C (Moderately modified) BAS: Category: C RMO Category: Improve



of

3. Coastal Environment

3.1.	Was a specialist study conducted?	YES	**NO**
3.2.	Provide the name and/or company who conducted the specialist study.		
None.			
3.3.	Explain how the relevant considerations of Section 63 of the ICMA were taken into account and explain how this influenced your proposed development.		
ICMA has not been considered as the proposed pipeline is a minimum of 1km inland of any coastal property or zone.			
3.4.	Explain how estuary management plans (if applicable) has influenced the proposed development.		
The proposed pipeline is will not impact on any estuary environment.			
3.5.	Explain how the modelled coastal risk zones, the coastal protection zone, littoral active zone and estuarine functional zones, have influenced the proposed development.		
None of these zones have been considered as the proposed pipeline is a minimum of 1km inland of any coastal property or zone.			

4. Biodiversity

4.1.	Were specialist studies conducted?	**YES**	NO
4.2.	Provide the name and/or company who conducted the specialist studies.		
• Terrestrial Biodiversity & Botanical Assessment: Jamie Pote (Pr. Sci. Nat.) • Animal Species Assessment: Arcus • Agricultural Impact Assessment: Johann Lanz - Soil Scientist (Pr.Sci.Nat.)			
4.3.	Explain which systematic conservation planning and other biodiversity informants such as vegetation maps, NFEPA, NSBA etc. have been used and how has this influenced your proposed development.		

The following systematic conservation planning, and biodiversity informants were utilized and summarized below:

Table 9: Summary of Regional Planning Biodiversity features.

FEATURE[2]	DESCRIPTION	IMPLICATIONS/COMMENT
National Environmental Screening Tool (Terrestrial Biodiversity)	Very High Terrestrial Biodiversity Medium Animal Species Medium & Low Plant Species Very High Aquatic Sensitivity	CBA 1 & 2, ESA 1 & 2, FEPA sub-catchment, Protected Areas & Vulnerable ecosystem. Animal & Plant species potentially present in proximity to site (refer to species assessment section). Several watercourses are traversed.
National Vegetation Map (NVM, 2018)	Garden Route Shale Fynbos Southern Afrotemperate Forest South Outeniqua Sandstone Fynbos Tsitsikamma Sandstone Fynbos	Vulnerable Least Concern Least Concern Least Concern
Regional Planning: Sub-Tropical Ecosystem Planning (STEP)	No thicket designated – several non-thicket, fynbos & forest communities identified, outside of thicket biome.	Afrotemperate Forest (Critically Endangered), Tsitsikamma Plateau Fynbos (Vulnerable), Keurbooms Grassy Fynbos & Tsitsikamma Mountain Fynbos Complex (Currently not Vulnerable)
GRBSP	Knysna Enon Fynbos, Keurbooms Thicket-Forest, Covie Coastal Proteoid Fynbos, Tsitsikamma Riverine Forest, Tsitsikamma Perennial Stream, Upland Grassy Fynbos, Tsitsikamma Forest Fynbos, Tsitsikamma Plateau Forest & Tsitsikamma Plateau Proteoid Fynbos	Portions of the route traverse areas designated CBA and ESA in terms of f the GRBSP.
WCBSP	Critical Biodiversity Areas Ecological Support Areas Protected Areas	Most of the route traverses areas designated either Other Natural Areas or Ecological Support Areas (1 & 2) associated with the transformed landscape, powerline corridors and/or the road reserve. A small section passes through designated CBA and a private nature reserve more or less centrally along

FEATURE[2]	DESCRIPTION	IMPLICATIONS/COMMENT
		the route just to the west of The Crags.
Critically Endangered and Endangered Ecosystems (NBA 2018)	None	N/A
Vulnerable Ecosystems (NBA)	Garden Route Shale Fynbos	Transformation levels have exceeded 40 % for the unit. The site and vegetation unit is within a rural farming area with elevated levels of transformation and directly adjacent to the N2 National Road with associated elevated disturbances. Alien vegetation impacts are also significant

of

4.4.	Explain how the objectives and management guidelines of the Biodiversity Spatial Plan have been used and how has this influenced your proposed development.

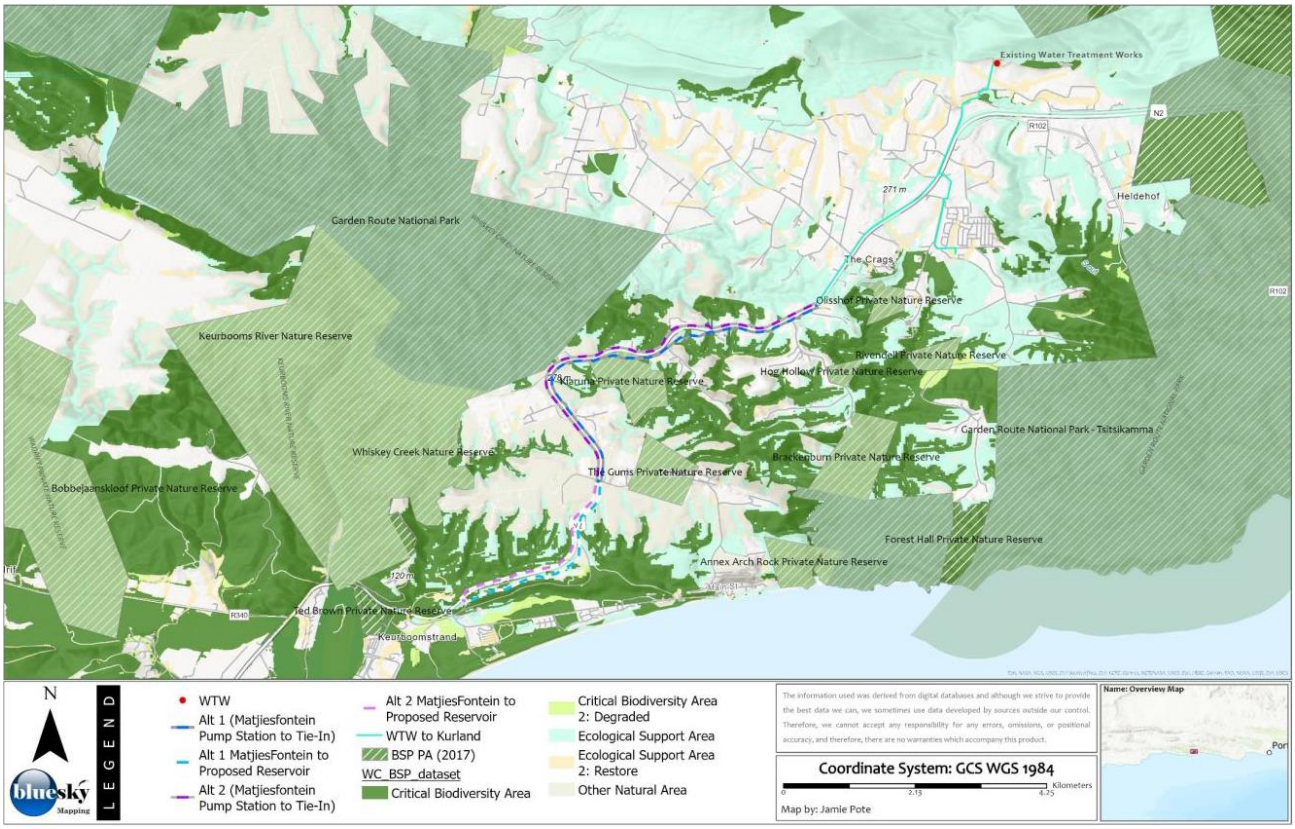
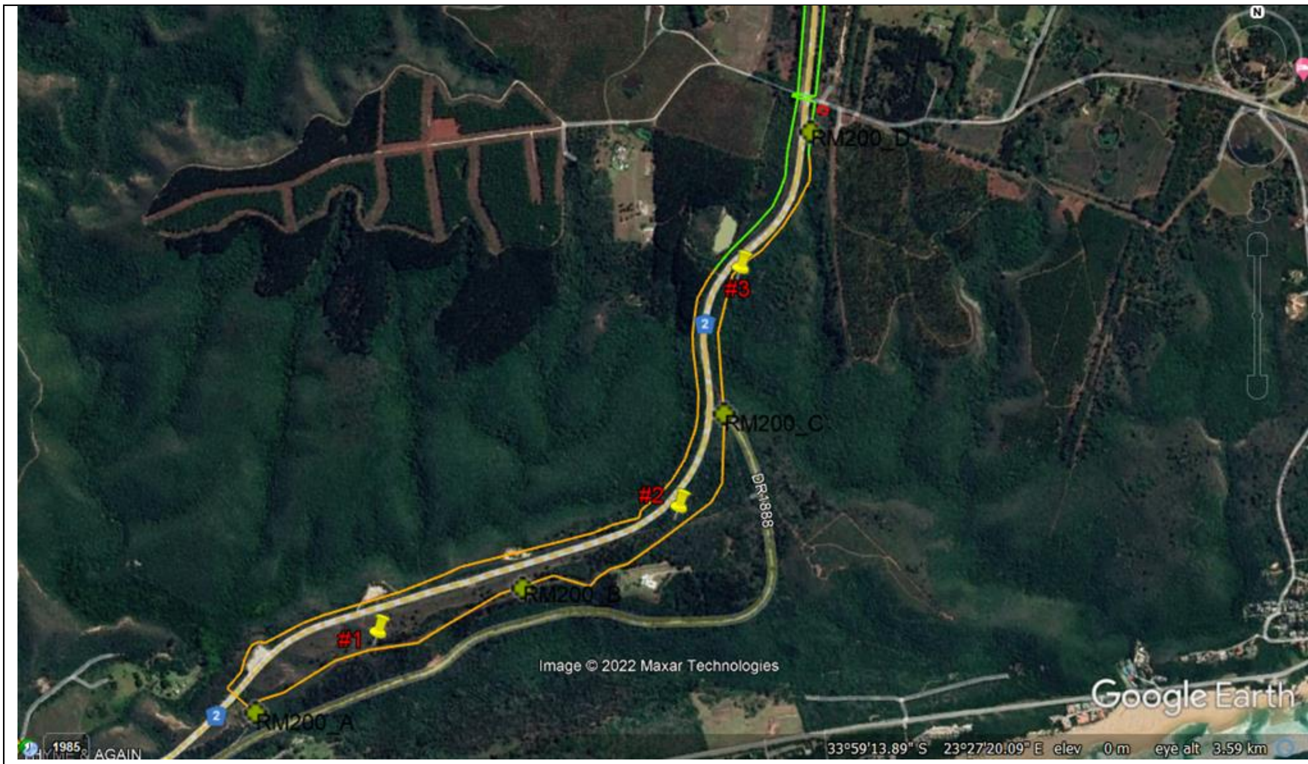


Figure 34: Critical Biodiversity and Protected Areas (WCBSP, 2017).

As indicated in Figure 34, portions of the proposed activity is situated within and/or in proximity to WC BSP (2017) designated CBA and ESA area; however, most of the route is outside of such designated CBA or ESA areas, including the proposed upper Matjiesfontein pump station and expansion of Kurland WTW infrastructure, which is to some extent due to it falling within degraded and/or transformed areas since it is situated directly adjacent to the road reserve, or in areas that are not designated such a status.

The proposed Matjiesfontein pump station falls within designated ESA 2 and the route crosses along the edge of several designated CBA 1 patches or within designated ESA 1, including a portion of the proposed alternative existing Matjiesfontein reservoir to upper Matjiesfontein pipeline and the preferred and alternative proposed pipelines between the upper Matjiesfontein pumpstation and The Crags (in the vicinity of Kiaruna Private Nature Reserve). The proposed preferred pipeline route between the existing Matjiesfontein reservoir and the proposed upper Matjiesfontein pumpstation follows a band of designated ESA 1, which corresponds to an existing powerline servitude.

4.5.	Explain what impact the proposed development will have on the site specific features and/or function of the Biodiversity Spatial Plan category and how has this influenced the proposed development.



Agricultural Impact Assessment:

An Agricultural Compliance Statement was found to be sufficient to address this theme. The specialist concluded that the impact of the proposed development on the agricultural production capability of the site is assessed as being acceptable. This is because the actual pipeline route has little agricultural production potential due to its location mostly along a road, and because of the temporary nature of the linear impact. The agricultural impact of the proposed development is therefore insignificant, and from an agricultural impact point of view, it is recommended that the development be approved.

The protocol requirement of confirmation that all reasonable measures have been taken through micro-siting to avoid or minimise fragmentation and disturbance of agricultural activities, is not relevant in this case.

No further agricultural assessment of any kind is required for this application.

Terrestrial Biodiversity & Botanical Assessment

The project area is generally characterised by undulating hills and plains, vegetated with a mozaic of fynbos communities with bands and pockets of natural forest, incised by occasional perennial and non-perennial rivers, generally draining to the south. The general area has notably moderate to high levels of transformation, degradation and utilization, in the corridor along the N2 between Keurboomstrand, The Crags and Kurland. Plantations of gum and pine trees are prevalent surrounding the site as well as numerous small farm dwellings, accommodation facilities such as guesthouses and other tourism related infrastructure. Extensive cultivated areas (pastures) are present between The Crags and Kurland, used primarily for horses and other livestock. Alien invasion (Blackwood, Black Wattle, Rooikrantz, Eucalyptus and Pine) is prevalent and significant, with extensive stands of dense alien vegetation. Even intact or semi-intact vegetation pockets tend to have alien trees present to a greater or lesser extent.

Two key ecological corridors are noted (Figure 35), one being at the southern end surrounding the existing Matjiesfontein reservoir and the second towards The Crags, in the vicinity of the Kiaruna Private Nature Reserve. These two corridors effectively encompass Southern Afrotemperate Forest - Garden Route Shale Fynbos bands that run in a north-west to south-east direction. While the National Vegetation Map shows these units as being contiguous units, on the ground the situation is somewhat more complex, with a patchwork of forest and fynbos rather being evident, with some plantations.

It would appear from on-site observations, that the Fynbos (Garden Route Shale Fynbos), in the

4.6.	If your proposed development is located in a protected area, explain how the proposed development is in line with the protected area management plan.

The Kiaruna Private Nature Reserve is the only protected environment that will potentially be directly affected by the proposed activity, as the preferred option will traverse this reserve, closest to the N2 Road Reserve.

Other protected areas in the broader vicinity, which are unlikely to have any direct or indirect impacts of significance include Whiskey Creek Nature Reserve, Keurbooms River Nature Reserve, The Gums Private Nature Reserve, Garden Route National Park, Annex Arch Rock Private Nature Reserve, Forest Arch Nature Reserve, Brackenburn Private Nature Reserve, Hog Hollow Private Nature Reserve, Ollishof Private Nature Reserve, Rivendell Private nature Reserve, Ted Brown Private Nature Reserve & Buitenverwachting Private Nature Reserve.

4.7.	Explain how the presence of fauna on and adjacent to the proposed development has influenced your proposed development.

According to the Terrestrial Animal Species Compliance Statement, it was concluded that due to the nature of the proposed development, the level of habitat transformation and presence of existing impacts along the proposed route, the study area is of very low sensitivity for terrestrial animal species, and SCC. There is a noted potential loss of habitat, due to destruction during construction resulting in disturbance and displacement of potential SCC, however the specialist confirmed this is a temporary impact; and given this short-lived impact, narrow proposed developmental footprint and proximity to existing impacts (N2 national highway, agricultural- and recreational land use) potential SCC will be able to easily move into the surrounding natural habitat and return once construction is completed.

Therefore, the proposed development will not likely have a significant negative impact on the long-term viability or persistence of terrestrial animal SCC in the area and the proposed development can be approved from a Terrestrial Animal Species perspective with no conditions to which this compliance statement is subjected.

The Terrestrial Biodiversity Assessment did include general mitigation measures for faunal impacts, which have been integrated into the BAR and EMPr.

5. Geographical Aspects

Explain whether any geographical aspects will be affected and how has this influenced the proposed activity or development.
The site falls within a gently undulating landscape, incised by a network of perennial and non-perennial rivers that generally drain towards the south and south-east.

6. Heritage Resources

6.1.	Was a specialist study conducted?	YES	**NO**
6.2.	Provide the name and/or company who conducted the specialist study.		
Dr Jayson Orton			
6.3.	Explain how areas that contain sensitive heritage resources have influenced the proposed development.		

A NID was undertaken by Dr Jayson Orton, an archaeologist and heritage consultant. It was concluded that given that the proposed work is mostly subsurface with the above ground components generally not in public view, there are no visual/landscape concerns. Significant archaeological impacts are highly unlikely. The only remaining concern is palaeontology, but Bamford's review of the geology suggests that identifiable and scientifically useful fossils are unlikely to be revealed in the upper weathered and altered geological deposits of the study area and the soils covering them. Fresh rock exposures are not anticipated to be encountered in the trenches.

The specialist recommended that no heritage impact assessment is required. The NID was submitted to Heritage Western Cape on the 09th of June 2022, and as per Appendix E1, Heritage Western Cape agreed with the specialist's conclusion.

7. Historical and Cultural Aspects

Explain whether there are any culturally or historically significant elements as defined in Section 2 of the NHRA that will be affected and how has this influenced the proposed development.

According to the specialists' findings, the following heritage resources exist on the site and in its environs, the specialist has further highlighted the nature of any impact upon them:

Heritage Resource	Heritage Resources on and around site - Description	Description of impact on heritage resource
Places, buildings, structures and equipment of cultural significance	The only historical structure seen close to the proposed pipeline in the stone church in Kurlands Village.	No impacts expected.
Landscapes and natural features of cultural significance	The wider area is very scenic owing to the greenery and forests. For this reason, the southern Cape section of the N2 is known as "The Garden Route".	Although some vegetation will be removed during excavation of the trenches, these areas will revegetate in time and no long-term impacts to the scenic qualities are expected from the pipeline. The new reservoir and other upgrade work will not be in full public view and are not expected to result in any visual impacts to the landscape.
Archaeological resources	It must be noted that the survey was severely restricted by limited access and dense vegetation cover. It is possible that isolated stone artefacts or historical artefacts might be present, although none were seen. Importantly, glimpses of the substrate could be obtained in various places along the length of the route (on gravel tracks, in road cuttings, etc). A survey for a temporary relocation area (NID submitted in 2021) and a housing development nearby (NID still to be submitted) revealed just one Stone Age flake. The substrate did not contain the type of gravel clasts in which significant Stone Age materials are typically found and in all the places where the substrate could be seen it was always unconsolidated soil or clay. Important archaeological heritage is thus not expected anywhere in the study area.	No significant impacts expected.
Palaeontological resources	The pipeline route passes through some areas of high and very high palaeontological sensitivity (see attached palaeosenstivity map). However, the rocks of the southern coastal plain are well-known for the high degree of weathering and alteration, and this was seen along the route during the survey. For this reason. a professional palaeontological opinion was requested from Prof. Marion	No significant impacts expected.

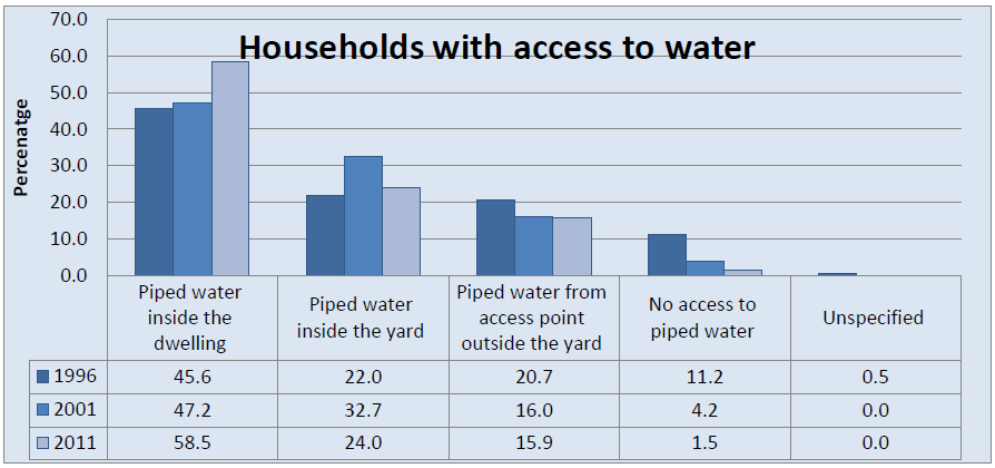
8. Socio/Economic Aspects

8.1.	Describe the existing social and economic characteristics of the community in the vicinity of the proposed site.

According to the Bitou IDP (2017), the official unemployment rate is more than ~30%, which is the highest in the Garden Route District Municipality. Bitou has a very youthful population demographic with more than a quarter (25.4%) between the ages of 0-14 years of age. Approximately 38% of working age youth are unemployed according to 2011 data. It is further added that unemployment affects up to 80% of communities (Bitou IDP, 2017). The sectors contributing the most to employment in Bitou at 2015 levels were (1) wholesale, retail trade, catering and accommodation (18.6%); and (2) construction (12.2%), with construction having the highest growth of 6.6% (Bitou IDP, 2017). With respect to skills levels, 21.2% of the labour force is skilled, 42.6% is semi-skilled, and 36.2% is unskilled. Over the period 2004 to 2015, skills levels in the municipality increased by 1.1% per annum. The sectors contributing the most to Bitou's economy at 2015 levels were (1) wholesale, retail trade, catering and accommodation (23.7%); and (2) community, social and personal services (19.3%) (Bitou IDP, 2017).
Bitou's population grew by an average of 3.77% annually between 2011 and 2016 (Bitou IDP, 2017). Bitou's IDP (2017) acknowledges that

> "When comparing this trend vs. service delivery there will be a proportionate increase in the demand for municipal services. The demand for more services will have a direct effect on the cost of providing that service and local government will be forced to push that cost to the already tax burdened rate payers."

82.5% of households in the municipal area have access to piped water on their premises (see Figure 20). Ward 1, the ward in which Kurland and the proposed development are located, has the worst access to water statistics in the municipality; with more than 6% of households having no access to potable water (see Figure 21). The existing maximum capacity of the water supply system in Kurland, is 600 Kℓ/day, which was set to be exceeded by the peak demand in 2017 already.



	Piped water inside the dwelling	Piped water inside the yard	Piped water from access point outside the yard	No access to piped water	Unspecified
1996	45.6	22.0	20.7	11.2	0.5
2001	47.2	32.7	16.0	4.2	0.0
2011	58.5	24.0	15.9	1.5	0.0

Figure 45: Percentage of Household who have Access to Potable Water (Bitou IDP, 2017).

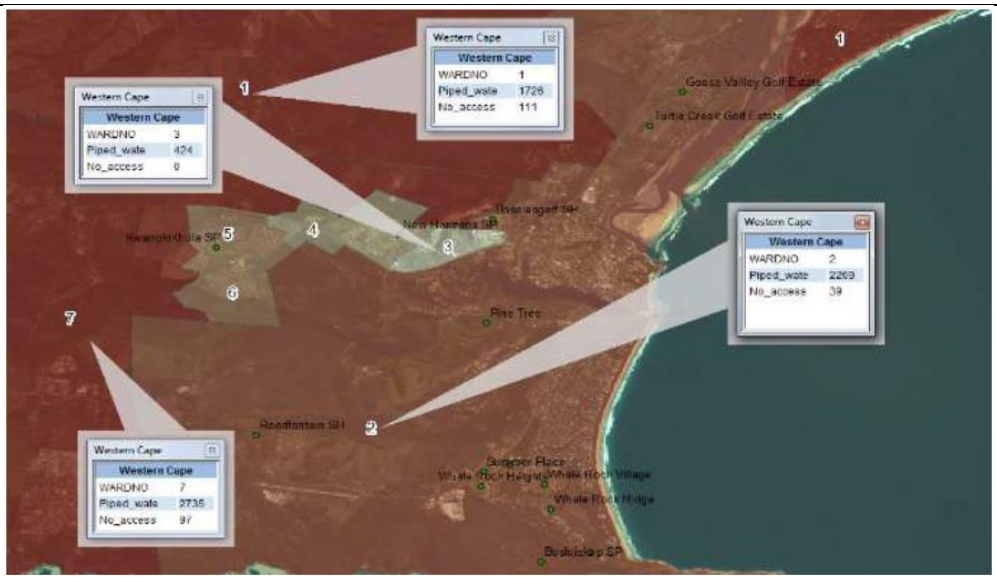


Figure 46: Map Indicating Wards with Piped Water and Number of Households With No Access to Piped Water (Bitou IDP, 2017).

The municipality has a housing backlog of 8 800 units as per the 2017 IDP. According to the Bitou Municipal IDP (2017), Kurland Village is a very high-density settlement located on land that is zoned as mixed use, of which 80% is municipal property and 20% is private property. North-west of Kurland Village is Kurland Informal Settlement which accomdates 1 455 people in 485 informal dwellings.

Figure 47: Kurland Informal Settlement (Bitou IDP, 2017)

To address the housing backlog the municipality plans to develop 1500 affordable (social and gap) housing units as part of the future proposed Kurland Housing Development (Bitou IDP, 2017). This will increase the demand for potable water access in the Kurland area.

8.2.	Explain the socio-economic value/contribution of the proposed development.

The National Department of Environmental Affairs (2017) and the Western Cape Department of Environmental Affairs and Development Planning's (2011) environmental impact assessment Guidelines on Need and Desirability requires that the need and desirability of a project are considered and evaluated against the tenets of sustainability. This requires an analysis of the effect of the project on social, economic and ecological systems, and places emphasis on consideration of a project's justification in terms of the specific needs and interests of the community.

Economic Aspects:

Bulk infrastructure services (including water, electricity, sewer, roads, etc.) are economic enablers. The proposed development to expand the capacity of the Bitou Municipality's bulk water infrastructure system will enable economic growth in the community. The engineering technical report by Lyners and Associates (2022) estimates a total investment of R70 million for the proposed development to be completed. This will directly stimulate local economic growth.

According to the Bitou IDP (2017), unemployment in the municipality is very high amounting to more than 33% for the general population and approximately 38% for youth in 2011. It is further added that unemployment affects up to 80% of communities (Bitou IDP, 2017). The proposed development will generate multiple temporary and permanent opportunities during its construction and operation phase. Through providing bulk infrastructure, the development will indirectly stimulate investment and economic growth in the Kurland area, which will create indirect employment and economic opportunity.

Social Aspects:

According to the Bitou Municipal IDP (2017), the "most critical development and internal transformation needs" include, inter alia:

- Water: No dams, limited water supply, lack of potable water.
- Infrastructure: Limited bulk infrastructure, landfill site needs, challenges with maintenance of Infrastructure
- Housing: Development of affordable (social and gap) housing.

The IDP further provides that 82.5% of households in the municipal area have access to piped water on their premises. Ward 1, the ward in which Kurland and the proposed development are located, has the worst access to water statistics in the municipality; with a more than 6% water backlog. The existing maximum capacity of the water supply system in Kurland, is 600 Kℓ/day, which was set to be exceeded by the peak demand in 2017 already. Added to the existing water demand, the municipality plans to develop 1500 affordable (social and gap) housing units as part of the future proposed Kurland Housing Development to alleviate the 8 800-unit housing backlog in the municipality (Bitou IDP, 2017). According to the engineering technical report by Lyners and Associates (2022), pipelines are designed for a 20-year period and the required capacity in 2043 is projected to be 2 930 Kℓ/day. The proposed development aims to meet the peak water demand as projected for 2043.

Therefore, the proposed development of bulk water infrastructure, as set out in Bitou Municipal Water Services Development Plan (2020), will enable the municipality to address three of its most critical development needs (i.e. water access, bulk infrastructure, housing), and to meet the basic needs of housing and access to clean and safe water as enshrined by Sections 26 and 27 of the South African Constitution (1996). This will help ensure that the Bitou Local Municipality meets its mandate in terms of Chapter 7 of the Constitution (1996) and the Municipal Systems Act (Act 32 of 2000) to deliver basic municipal services to the Kurland community that are necessary to ensure acceptable and reasonable quality of life.

Ecological Aspects:

Majority of the proposed infrastructure (pipelines) is subsurface; therefore, the ecological impacts are temporary, and the appointed Aquatic Biodiversity, Terrestrial Biodiversity, and Animal Species specialists concluded that the proposed development can be constructed within acceptable

ecological impact limits provided that the recommended mitigation actions are adhered to.

Evidently, the proposed project is justifiably needed and desirable in terms of the social, economic, and ecological needs of the community.

8.3.	Explain what social initiatives will be implemented by applicant to address the needs of the community and to uplift the area.

The proposed development will include the investment of millions of Rands into the development of bulk water infrastructure in Kurland, Ward 1, Bitou Local Municipality. Against the backdrop of the more than ~30% official unemployment rate in the Bitou Municipality (IDP, 2017), the proposed multi-million Rand development will directly provide temporary employment and skills-transfer opportunities during the construction phase, and long-term employment opportunities during the operational phase. Through improving the water service delivery capacity and reliability, the proposed development will address the need of access to potable water of communities in Ward 1, Bitou Municipality. The improved capacity of bulk water services will both benefit the existing communities and provide services capacity for future housing development which is another basic need and a constitutional right.

In addition, by providing reliable bulk water services it may increase investor confidence in the area which will indirectly create employment opportunities. During the construction phase the proposed development will support local contractors and suppliers by sourcing labour and construction material locally, where reasonably available and in accordance with municipal tender processes as required by Section 83 of the Municipal Services Act (2000), and in accordance with the Public Finance Management Act (Act 1 of 1999, amended 2009).

8.4.	Explain whether the proposed development will impact on people's health and well-being (e.g. in terms of noise, odours, visual character and sense of place etc) and how has this influenced the proposed development.

Due to the subsurface nature of the majority of the proposed infrastructure (e.g. pipelines), the adverse impacts on people's health and well-being (e.g. in terms of noise, odours, visual character and sense of place etc) will be limited to the construction phase. The provision of additional potable water capacity, the associated increased access to potable water, and the development enabling the municipality to address the housing backlog, will impact positively on the people's health and quality of life.

Considering the above-mentioned temporary negative impacts and long-term positive impacts, the development poses low health, well-being and nuisance risks to the surrounding community. During operational phase, if managed and operated as per specifications, the proposed development will have minimal impact on human health. In fact, the development will contribute to and enable the municipality to deliver basic municipal services and meet basic human needs, including access to clean and safe water, and housing as enshrined by Sections 26 and 27 of the South African Constitution (1996). This will help ensure that the Bitou Local Municipality meets its mandate in terms of Chapter 7 of the Constitution (1996) and the Municipal Systems Act (Act 32 of 2000) to deliver basic municipal services to the Kurland community that are necessary to ensure acceptable quality of life.

SECTION H: ALTERNATIVES, METHODOLOGY AND ASSESSMENT OF ALTERNATIVES

1. Details of the alternatives identified and considered

~~1.1.~~	~~Property and site alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts.~~

~~Provide a description of the preferred property and site alternative.~~

~~Provide a description of any other property and site alternatives investigated.~~

~~Provide a motivation for the preferred property and site alternative including the outcome of the site selectin matrix.~~

~~Provide a full description of the process followed to reach the preferred alternative within the site.~~

~~Provide a detailed motivation if no property and site alternatives were considered.~~

~~List the positive and negative impacts that the property and site alternatives will have on the environment.~~

1.2.	Activity alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts.

Provide a description of the preferred activity alternative.

Preferred Activity Alternative 1: Combination of boreholes, pipelines, reservoir and pumpstations (as proposed) to source water supply.

The proposed bulk water upgrades will utilize existing infrastructure but will also accommodate for a bigger rising main, additional pumpstations and a new reservoir, from which water can be transported south toward Keurbooms. In addition, two new boreholes are intended to be utilized within the existing WTW's.

Provide a description of any other activity alternatives investigated.

Activity Alternative 2: Utilizing only boreholes to source water supply.

The establishment of multiple boreholes, only, to provide the additional water supply required to meet the projected demands.

Provide a motivation for the preferred activity alternative.

Activity alternative 2 will allow for less disturbance to the existing terrestrial and aquatic environments that will be disturbed during construction of the pipelines. However, groundwater is not a reliable and consistent resource and if over pumped and not permitted to replenish sufficiently, can be exhausted.

Activity alternative 1 utilizes water extracted from the Keurbooms river. The immediate area does not necessarily need to experience rainfall in order to ensure supply to the river as events upstream will influence quantity and quality downstream. While river capacities are not consistent, this has been a reliable source of water thus far, and the addition of the boreholes will support and supplement the supply without damaging or compromising the integrity of the aquifer and its capacity. Further to this all terrestrial and aquatic features predicted are temporary (confirmed by specialists). Therefore, this is the most reasonable and feasible option.

Provide a detailed motivation if no activity alternatives exist.

Alternatives have been considered.

List the positive and negative impacts that the activity alternatives will have on the environment.

Preferred Activity Alternative 1: Combination of boreholes, pipelines, reservoir and pumpstations (as proposed)

Positive impacts on the environment:

- Risk to aquatic features were found to be low, after mitigation.
- Risk to terrestrial features was found to be low, after mitigation.
- Opportunity for multiple employment opportunities for labour of various skill levels.
- The pipeline is the most feasible and reasonable option.
- Opportunity for alien invasive clearance in this area, and rehabilitation.
- Disturbance is temporary, and the area can be re-established within 2-years, except in forest environments.

Negative Impacts on the environment:

- Indigenous vegetation will be lost.
- Alien invasive encroachment due to disturbance.
- Temporary nuisances.
- Landowner negotiations to obtain servitudes within private land.
- Potential disgruntled landowners.
- Access/traffic impacts.

Activity Alternative 2: Utilizing only boreholes

Positive impacts on the environment:

- High risk to aquifer.
- Disturbance is temporary, and the area can be re-established within 2-years, except in forest environments.

Negative Impacts on the environment:

- Unreliable supply of water.
- Excessive pumping can impact upon the aquifer.
- No risk to aquatic features.
- No risk to terrestrial features.
- Limited opportunity for employment opportunities for labour of various skill levels.
- No opportunity for alien invasive clearance and rehabilitation along the pipeline routes.

1.3.	Design or layout alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts

Provide a description of the preferred design or layout alternative.

Preferred Proposed Alternative 1 Layout: 200mm Rising Main and New Pump Station and Reservoir (South of the N2)

The preferred 200mm rising main is located to the south of the N2, 6m within the 60m building line of the farm portions located to the South of the N2. The pipeline is approximately 9.25km's in length and will cross the N2, and its relevant road reserves once to tie-in with the existing 160mm pipeline located on Farm No. 490, north of the N2. The pipeline will remain outside of the new N2 road reserve, until the tie-in and road crossing.

Provide a description of any other design or layout alternatives investigated.

Proposed Alternative 2 Layout: 200mm Rising Main and New Pump Station and Reservoir (North of the N2)

The proposed alternative 2 200mm rising main and new pump station and reservoir would be located to the North of the N2. The pipeline would be located in close proximity to the N2, within the existing road reserve. The pipeline is approximately 9.25km's in length.

Provide a motivation for the preferred design or layout alternative.

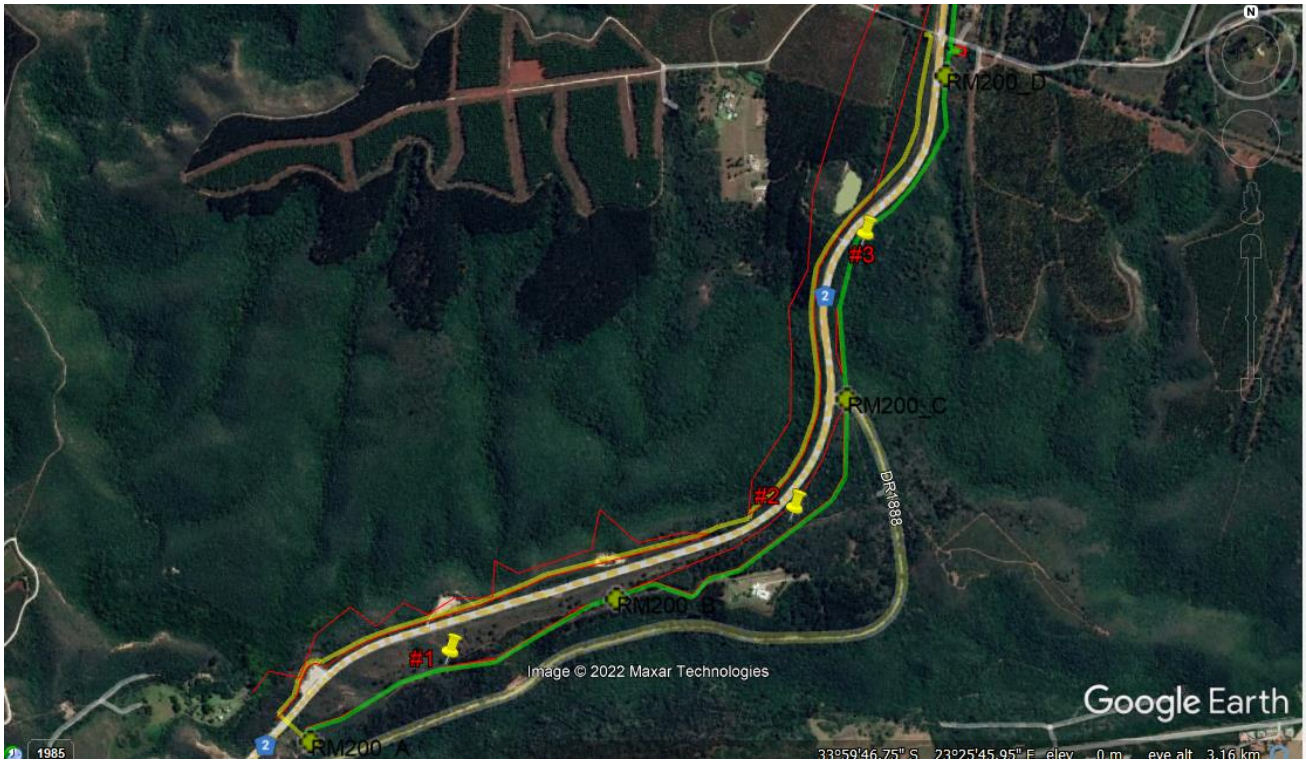


Figure 48: Depicting the proposed Alternative 1 (green polyline) and proposed Alternative 2 (yellow polyline) 200mm Rising Mains to the Proposed Pump Station and Reservoir, in respect to the new N2 road reserve (red polygons).

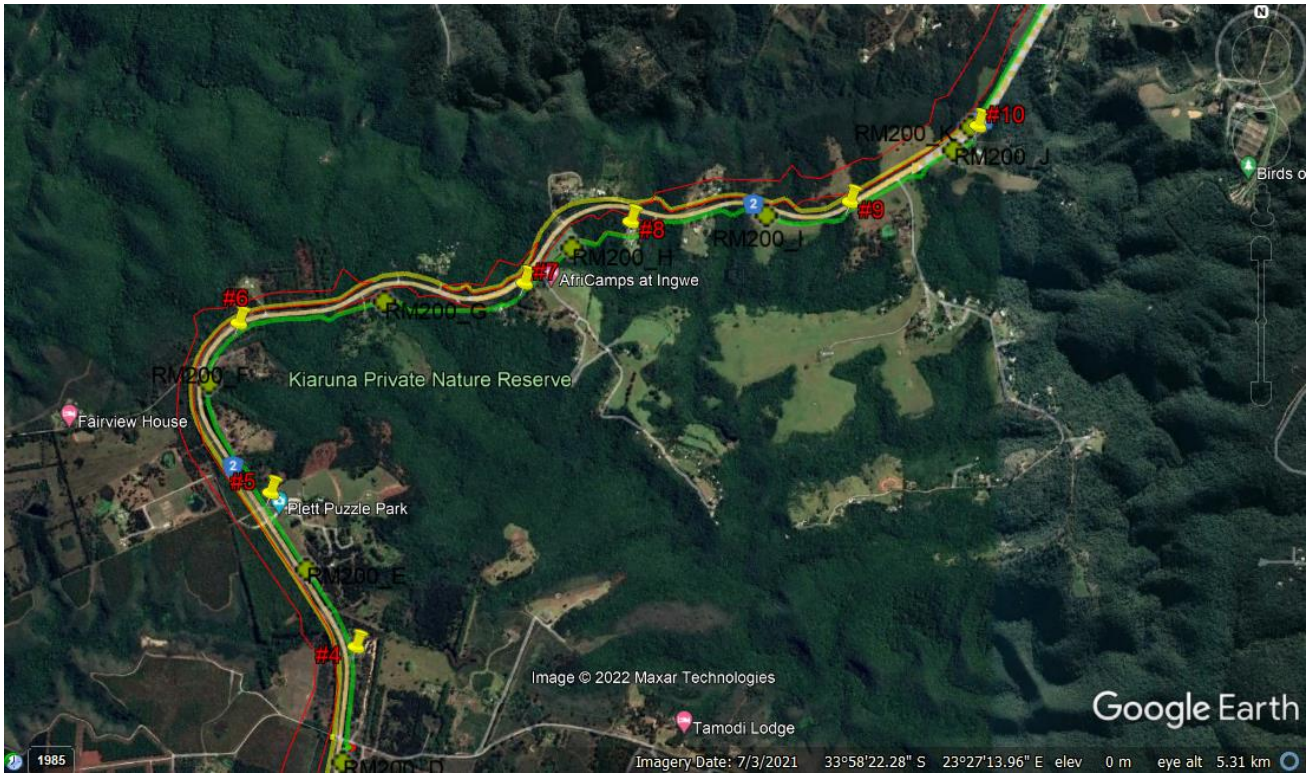


Figure 49: Depicting the proposed Alternative 1 (green polyline) and proposed Alternative 2 (yellow polyline) 200mm Rising Mains to the existing tie-in, in respect to the new N2 road reserve (red polygons).

As depicted in Figure 48 and Figure 49 the Alternative 2 is located within adjacent to the existing N2, within the new SANRAL road reserve, SANRAL has made it clear that they will not permit development within the new road reserves, which dominate the northern side of the N2. The pipeline will then need to be moved further west on the North side of the N2, and based on the steep topography and dense vegetation, the pipeline will become longer and will incur significant additional costs that make this alternative unreasonable to pursue. Therefore, the preferred alternative 1 is the most feasible and reasonable alternative.

Provide a detailed motivation if no design or layout alternatives exist.

Alternatives have been considered.

List the positive and negative impacts that the design alternatives will have on the environment.

Proposed Preferred Alternative 1: Layout - 200mm Rising Main North of N2

Positive impacts on the environment:

- Risk to aquatic features were found to be low, after mitigation.
- Risk to terrestrial features was found to be low, after mitigation.
- Opportunity for multiple employment opportunities for labour of various skill levels.
- The pipeline is the most feasible and reasonable option.
- Opportunity for alien invasive clearance in this area, and rehabilitation.
- Disturbance is temporary, and the area can be re-established within 2-years, except in forest environments.
- Outside new N2 road reserve.

Negative Impacts on the environment:

- Indigenous vegetation will be lost.
- Alien invasive encroachment due to disturbance.
- Temporary nuisances.
- Landowner negotiations to obtain servitudes within private land.
- Potential disgruntled landowners.
- Access/traffic impacts.

Proposed Alternative 2: Layout - 200mm Rising Main North of N2

Positive impacts on the environment:

- Risk to aquatic features were found to be low, after mitigation.
- Risk to terrestrial features was found to be low, after mitigation.
- Opportunity for multiple employment opportunities for labour of various skill levels.
- Opportunity for alien invasive clearance in this area, and rehabilitation.
- Disturbance is temporary, and the area can be re-established within 2-years, except in forest environments.

Negative Impacts on the environment:

- Significant visual impacts given its proximity to the N2, but are temporary.
- The landowner will not consent to the placement of this pipeline within their property.
- Will affect future development planned for the N2.
- Given the proximity to the N2 traffic impacts are predicted but are temporary.

~~1.4.~~	~~Technology alternatives (e.g., to reduce resource demand and increase resource use efficiency) to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts.~~

~~Provide a description of the preferred technology alternative:~~

~~Provide a description of any other technology alternatives investigated.~~	
~~Provide a motivation for the preferred technology alternative.~~	
~~Provide a detailed motivation if no alternatives exist.~~	
~~List the positive and negative impacts that the technology alternatives will have on the environment.~~	
~~1.5.~~	~~Operational alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts.~~
~~Provide a description of the preferred operational alternative.~~	
~~Provide a description of any other operational alternatives investigated.~~	
~~Provide a motivation for the preferred operational alternative.~~	
~~Provide a detailed motivation if no alternatives exist.~~	
~~List the positive and negative impacts that the operational alternatives will have on the environment.~~	
1.6.	The option of not implementing the activity (the 'No-Go' Option).
Provide an explanation as to why the 'No-Go' Option is not preferred.	
The No-Go option will imply that the status quo persists. At present one of the most significant backlogs facing the municipality, like so many others across the Western Cape, is the demand for housing. Multiple plans are in place to supply housing for within Bitou, however, if services are unavailable the housing will not be sustainable, as it will strain the existing infrastructure, and impact on the existing supply, if undertaken without this upgrade. This proposal endeavours to address the bulk water supply within the Kurland area, in doing so this will support the progression of the proposed housing development planned for this area.	
1.7.	Provide and explanation as to whether any other alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts, or detailed motivation if no reasonable or feasible alternatives exist.
All alternatives have been discussed above.	
1.8.	Provide a concluding statement indicating the preferred alternatives, including the preferred location of the activity.
The preferred alternative 1 layout – 200mm rising main south of the N2 is the most reasonable and feasible alternative, given SANRAL's objection to positioning the pipeline within their property. Therefore, the Alternative 2 does not need to be discussed further as the option is not reasonable or feasible.	

2. "No-Go" areas

Explain what "no-go" area(s) have been identified during identification of the alternatives and provide the co-ordinates of the "no-go" area(s).
As advised in the aquatic report: - The reaches of the watercourses where no activities are planned to occur must be considered no-go areas. These no-go areas can be marked from a maximum distance of 5 m upstream and downstream of the proposed crossing in the watercourse. This 5 m construction area around the trenching site would allow for construction personal,

vehicles (if applicable) to enter the watercourse and install the pipelines;

It is recommended that all areas beyond the construction working corridor or site camp be considered No-Go areas.

3. Methodology to determine the significance ratings of the potential environmental impacts and risks associated with the alternatives.

Describe the methodology to be used in determining and ranking the nature, significance, consequences, extent, duration of the potential environmental impacts and risks associated with the proposed activity or development and alternatives, the degree to which the impact or risk can be reversed and the degree to which the impact and risk may cause irreplaceable loss of resources.

The assessment criteria utilized in this environmental impact assessment is based on, and adapted from, the *Guideline on Impact Significance, Integrated Environmental Management Information Series 5* (Department of Environmental Affairs and Tourism (DEAT), 2002) and the *Guideline 5: Assessment of Alternatives and Impacts in Support of the Environmental Impact Assessment Regulations* (DEAT, 2006).

Determination of Extent (Scale):

Site specific	On site or within 100 m of the site boundary.
Local	The impacted area includes the whole or a measurable portion of the site, but could affect the area surrounding the development, including the neighbouring properties and wider municipal area.
Regional	The impact would affect the broader region (e.g. neighbouring towns) beyond the boundaries of the adjacent properties.
National	The impact would affect the whole country (if applicable).

Determination of Duration:

Temporary	The impact will be limited to the construction phase.
Short term	The impact will either disappear with mitigation or will be mitigated through a natural process in a period shorter than 2 years.
Medium term	The impact will last up to the end of the construction phase, where after it will be entirely negated.
Long term	The impact will continue for the entire operational lifetime of the development but will be mitigated by direct human action or by natural processes thereafter.
Permanent	This is the only class of impact that will be non-transitory. Such impacts are regarded to be irreversible, irrespective of what mitigation is applied.

Determination of Probability:

Improbable	The possibility of the impact occurring is very low, due either to the circumstances, design or experience.
Probable	There is a possibility that the impact will occur to the extent that provisions must therefore be made.
Highly probable	It is most likely that the impacts will occur at some stage of the development. Plans must be drawn up to mitigate the activity before the activity commences.

Definite	The impact will take place regardless of any prevention plans.

Determination of Significance (without mitigation):

No significance	The impact is not substantial and does not require any mitigation action.
Low	The impact is of little importance but may require limited mitigation.
Medium	The impact is of sufficient importance and is therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.
Medium-High	The impact is of high importance and is therefore considered to have a negative impact. Mitigation is required to manage the negative impacts to acceptable levels.
High	The impact is of great importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.
Very High	The impact is critical. Mitigation measures cannot reduce the impact to acceptable levels. As such the impact renders the proposal unacceptable.

Determination of Significance (with mitigation):

No significance	The impact will be mitigated to the point where it is regarded to be insubstantial.
Low	The impact will be mitigated to the point where it is of limited importance.
Medium	Notwithstanding the successful implementation of the mitigation measures, the impact will remain of significance. However, taken within the overall context of the project, such a persistent impact does not constitute a fatal flaw.
High	Mitigation of the impact is not possible on a cost-effective basis. The impact continues to be of great importance, and, taken within the overall context of the project, is considered to be a fatal flaw in the project proposal.

Determination of Reversibility:

Completely Reversible	The impact is reversible with implementation of minor mitigation measures
Partly Reversible	The impact is partly reversible but more intense mitigation measures
Barely Reversible	The impact is unlikely to be reversed even with intense mitigation measures
Irreversible	The impact is irreversible and no mitigation measures exist

Determination of Degree to which an Impact can be Mitigated:

Can be mitigated	The impact is reversible with implementation of minor mitigation measures
Can be partly mitigated	The impact is partly reversible but more intense mitigation measures
Can be barely mitigated	The impact is unlikely to be reversed even with intense mitigation measures
Not able to mitigate	The impact is irreversible and no mitigation measures exist

Determination of Loss of Resources:

No loss of resource	The impact will not result in the loss of any resources
Marginal loss of resource	The impact will result in marginal loss of resources
Significant loss of resources	The impact will result in significant loss of resources
Complete loss of resources	The impact will result in a complete loss of all resources

Determination of Degree to which an Impact can be avoided:

High	The impact is completely avoidable
Medium	The impact is avoidable with moderate mitigation
Low	The impact is difficult to avoid and will require significant mitigation
Unavoidable	The impact cannot be avoided

Determination of Degree to which an Impact can be managed:

High	The impact is completely manageable
Medium	The impact is manageable with moderate mitigation
Low	The impact is difficult to manage and will require significant mitigation
Unmanageable	The impact cannot be managed

Determination of Cumulative Impact:

Negligible	The impact would result in negligible to no cumulative effects
Low	The impact would result in insignificant cumulative effects
Medium	The impact would result in minor cumulative effects
High	The impact would result in significant cumulative effects

4. Assessment of each impact and risk identified for each alternative

Note: The following table serves as a guide for summarising each alternative. The table should be repeated for each alternative to ensure a comparative assessment. The EAP may decide to include this section as Appendix J to this BAR.

	PREFERRED ALTERNATIVE 1 LAYOUT	NO-GO ALTERNATIVE
PLANNING, DESIGN AND DEVELOPMENT PHASE		
PRE-CONSTRUCTION		
Potential impact and risk:	**LEGISLATION COMPLIANCE AND PLANNING** **Preferred Alternative 1 Layout:** Commencement of activities without all relevant permits/permissions/approvals including registered servitudes, permits to remove specific vegetation, etc. as well as commencing without implementation of specialist recommendations, including search and rescue, and compliance with EMPr pre-construction activities, can result in penalties, time delays and excessive costs. All stemming from poor planning. Climate change considerations need to be addressed at this stage, and where possible, adaption/mitigation measures found to be feasible must be integrated into the final design/planning during construction, and financial provision must be made where necessary. **No-Go Alternative:** No change to status quo.	
Nature of Impact:	Negative	No change to status quo.
Extent, duration and magnitude of impact:	Local and short-medium term	
Consequence of impact or risk:	• Non-compliance with approvals. • Penalties/fines	
Probability of occurrence:	Low	
Degree to which the impact may cause irreplaceable loss of resources:	Low	
Degree to which the impact can be reversed:	Reversible	
Indirect impacts:	Disgruntled landowners.	

Cumulative impact prior to mitigation:		
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Medium**	
Degree to which the impact can be avoided:	High	
Degree to which the impact can be managed:	High	
Degree to which the impact can be mitigated:	High	
Proposed mitigation:	General: • Ensure programme of works is planned accordingly and includes recommended measures where necessary, such as implementing search and rescue activities. • Ensure financial allowances are made for the recommended measures, such as search and rescue plans, rehabilitation, etc. • Ensure all relevant permits/licenses/approvals are in place and are valid prior to commencing with works. • Ensure that the Contractor has accepted the approved EMPr and Environmental Authorization (and any other relevant permits/licenses, etc), as a part of their Tender Document, to ensure that they	

	are fully aware of their responsibilities in terms of the implementation of these documents. • Ensure that the Contractor provides method statements for activities intended to be undertaken, and these are checked and approved by the ECO as well as the Engineer. • Inform ECO of planned works ahead, so as to ensure inductions are undertaken timeously. • Involve ECO in selection of site camp location. Unplanned/Planned Shutdown: • Should site need to be closed, ensure the following is undertaken: - All waste is removed from site. - All stockpiled soils, etc. is removed from site or is bunded efficiently and covered with tarp, to minimize dispersion. - Ensure all excavations are backfilled, and recommended rehabilitation is commenced at the very least. - Ensure heavy machinery is stored safely. - Contact the ECO to undertake an inspection and advise on any appropriate measures that need to be undertaken. - It is important to note that the Environmental Authorization and approved EMPr is a legal and binding document, therefore regardless of reason for shutdown compliance with these conditions must be met, or the Competent Authority must be informed of the reason and estimated duration of shutdown. Climate Change Considerations including adaption, must	

	be integrated into the final design, and mitigation must be integrated into the construction scope of works, where necessary, all financial provision must be made : • Higher average annual temperature; Higher maximum temperatures; More hot days and more heat waves; Higher minimum temperatures - Adaption Measures: o The design must take into consideration that potential higher temperatures may result in an increase in water demand. This must be taken into consideration in the design and planning phase. o Where possible feasible alternative sources of raw water must be sourced, to supplement the water demand. o Boreholes should be monitored efficiently to ensure that whether or not the water demand increases, there is no strain on boreholes, that may compromise their capacity and integrity. - Mitigation Measures to Apply during Construction: o Daily assessment of weather conditions should be completed during construction stage, to ensure conditions are viable for labourers to be working outside (ie: temperatures are not excessive). o Potable water should be available for consumption during construction, to keep labourers hydrated. o Ensure that a safety officer is always on site and ensuring that working conditions are acceptable and safe.	

	• Reduced average rainfall in the Western Cape, particularly the western parts - Adaption Measures: o The design must take into consideration that rainfall capturing and storage may need considered in future. o Where possible feasible alternative sources of raw water must be sourced, to supplement the water demand. o Boreholes should be monitored efficiently to ensure that whether or not the water demand increases, there is no strain on boreholes, that may compromise their capacity and integrity. - Mitigation Measures to Apply during Construction: o Daily assessment of weather conditions should be completed during construction stage, to ensure conditions are viable for labourers to be working outside (ie: temperatures are not excessive). o Potable water should be available for consumption during construction, to keep labourers hydrated. o Ensure that a safety officer is always on site and ensuring that working conditions are acceptable and safe. o Implement rainwater capturing system for temporary storage of water to be utilized for washing tools, etc. o Utilize hand sanitizer for washing hands. o Request that labour use their own water bottles, to be filled up, rather than drinking	

	from taps. • Increased Fire Risk - Adaption Measures: o Position fire safety equipment at all proposed reservoir sites. o Establish non-smoking signage at all reservoir and pump station sites, to remind maintenance teams that this activity must be avoided. - Mitigation Measures to Apply during Construction: o During development fires should be strictly prohibited, smoking must be discouraged on site. (If the Contractor allows this activity there must be a designated area within the site camp, with an appropriate bin to contain discarded cigarettes, with an appropriately heavy cover, only permitted within the site camp where it can be controlled) No smoking is permitted within the working corridor. o If security is positioned on site, at night, they must be briefed on fire hazard risks. o During construction no uncontrolled fires are allowed. o Ensure emergency numbers are readily available with a working cell-phone on site, and if construction teams are split, the foreman responsible for each team is to ensure that he has these emergency numbers, and can contact emergency services immediately.	

	• Increase in the frequency and intensity of extreme weather events, including floods, droughts, and storm surges. - Adaption Measures: o The design must take into consideration that potential for storm surges to impact on infrastructure and its function. Measures to consider includes: ➢ Encase (potentially concrete) pipelines situated through watercourse beds, so that even if exposed in storm surge events, the pipeline is protected. Alternatively, utilize reno mattresses to cover buried pipeline. ➢ Consider integrating solar panels into the design of infrastructure, which require electrical sources to function. ➢ Future designs, where possible, must consider feasible alternative sources for raw water, to supplement the water demand. o Boreholes should be monitored efficiently to ensure that whether or not the water demand increases, there is no strain on boreholes, that may compromise their capacity and integrity. o All infrastructure should be maintained and monitored after significant storm events. - Mitigation Measures to Apply during Construction: o Apply designs as specified by engineer. o An appropriately experienced and qualified site engineer should monitor the	

	implementation of the proposed design.	
Residual impacts:	•	
Cumulative impacts post mitigation:	Low	
Significance rating of impact post mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low**	
Potential impact and risk:	**SITE ESTABLISHMENT AND PRE-CONSTRUCTION ACTIVITIES** **Preferred Alternative 1 Layout:** Poor site establishment can lead to long-term issues on site. Failure to appropriately designate working corridors can result in works exceeding the approved assessed footprint, resulting in non-compliance and potentially penalties and delays. **No-Go Alternative:** No change to status quo.	
Nature of Impact:	Negative	No change to status quo.
Extent and duration of impact:	Local and short-medium term	
Consequence of impact or risk:	• Site camp location may create issues and can lead to additional listed activities. • Non-compliance with approved documentation.	
Probability of occurrence:	Low	
Degree to which the impact may cause irreplaceable loss of resources:	Low	

Degree to which the impact can be reversed:	Reversible	
Indirect impacts:	Penalties, fines and time delays.	
Cumulative impact prior to mitigation:	Medium	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Medium**	
Degree to which the impact can be avoided:	High	
Degree to which the impact can be managed:	High	
Degree to which the impact can be mitigated:	High	
Proposed mitigation:	General: • Inform ECO of planned works ahead, so as to ensure inductions are undertaken timeously. • Involve ECO in selection of site camp location. • Ensure all labour and sub-contractors undergo environmental inductions. • Ensure flora permits are in place timeously (PNCO only) – allow at least 1 or 2 months before commencement. • Environmental Awareness and training (EAT) – Ensure all labour are informed and plant operators	

	are aware of risks, issues, dos and don'ts and no-go areas. Landowners; • Notify landowners of the construction programme to ensure that they are aware that construction activity may bring about delays/obstructions as well as ensuring that they are aware of any risks. • Ensure clear signage is erected on the access road. • Ensure that landowners are notified before private roads are crossed and this is done in a timeous and practical manner in order to ensure access is always available. Forest vegetation: • Reduce the working corridor to a maximum of 3m width. • Specialist appointed to undertake search and rescue should assess 3m corridor and identify any mature trees to avoid. • Engineer needs to confirm the route after on-site specialist input. • Specialist/ECO must undertake an appliocation for the removal of identified tree species, from trees Site Camp Establishment: • Ensure site selected is inspected and approved by ECO. • Utilize disturbed or transformed areas for site camp establishment. • Ensure the site camp is positioned on a levelled area and is easily accessible. • Ensure site camp is fenced off with appropriate fencing and shade cloth, to block out activities	

	within. • Ensure access to site is at one point, unless to existing points of entry/exit are identified. • Ensure access onto site is controlled. • Ensure there is 24hr security. • Designate specific areas for specific purpose, including storage areas, machinery storage areas, parking areas, waste disposal areas, etc. • Ensure an Environmental File is established on site that remains on site for the duration of construction, for auditing purposes. This file should contain as a minimum: - Copies of audit reports. - Copies of disposal/cleaning slips related to waste disposal at a registered waste disposal site and from company appointed to clean toilets. - Copies of purchase orders for rehabilitation material etc. - Copies of all approvals, including: Environmental Authorization, EMPr, and any other license/permit/approval. - Incident register. - Complaints register. - Copies of induction registers. • Infographics must be available on site in public areas, including information on safety measures, potential harmful fauna (ie. snakes common to the areas, and emergency contact information, including, but not limited to: Snake catchers, Ambulance; Fire Department; the closest hospital, veterinarian (ie: for anti-venom, etc). • Must contain a spill-kit.	

	• Plan positioning of Potable Toilets for labour working along the route. • Consider designating a vehicle for the transportation of labourers to toilets> the vehicke can be equipped with a spill-kit • Potable Toilets: - Ensure toilets are positioned on levelled areas and are protected from wind and rain that could result in them blowing over and spilling waste contents. - Ensure toilets are positioned at least 32m's from any watercourse. - Ensure toilets are rented from a registered company, with whom arrangements should be made for cleaning of these toilets on a weekly basis. - Disposal slips/cleaning slips from this company must be obtained following every cleaning and must be filed in the Environmental File. - Ensure an adequate quantity of toilets are provided at each working area. • Hazardous substances including oil/fuel etc. should be: - Stored in bunded areas, on hardened/impermeable surfaces, where the barrels/drums/containers are protected from the natural elements. - Appropriate signage indicating hazardous/flammable materials are stored. - A fire extinguisher and contact details for the fire department and other emergency numbers must be positioned in close proximity. - May only be decanted/filled on the	

	aforementioned surface. - Must be disposed of as hazardous waste, at an appropriately registered facility. Waste Management: • Designate areas for temporary waste storage, this area should be: • Protected from wind/rain displacement. • Should be on a levelled surface. • An appropriate number of skips/bins must be made available on site, to accommodate the various types of waste generated, as waste must be separated. • Ensure weighted covers are positioned on skips/bins, to ensure that animals cannot get into the bins as well as to avoid waste dispersion. • Label bins appropriately. • Ensure that the nearest appropriate waste disposal facility is identified and ensure that disposal is undertaken when waste has reached 75% capacity of the bin/skip. • No waste/excavated soil/ etc. intended to be removed from site may remain on site for more than 90-days. • Ensure waste receptacles are available where works are being undertaken, this can take the form of black bin bags, etc. however it must: • Be sufficient hold the waste without tearing/spilling. • It must be removed from site on a daily basis and re-established at the start of every day, when works occurs in that area. • Request that the foreman responsible for the labour team in a specific area, is responsible for ensuring that this waste receptacle is utilized, removed and	

	established daily. Working Corridor: • Designate working corridor, where possible and especially in sensitive areas (ie. forest areas and watercourses/riparian areas), utilize the smallest possible working corridor. • Utilize a physical barrier to indicate the extent of the working corridor, ie. poles and mesh fencing. • Maximum working corridor is 20m's. • Refer to EMPr for areas indicated as very sensitive, to ensure that the working corridors in these areas are reduced as much as possible. • Ensure the search and rescue plan is undertaken, prior to construction activities.	
Residual impacts:		
Cumulative impacts post mitigation:		
Significance rating of impact post mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low**	
CONSTRUCTION		
Potential impact and risk:	**EROSION, EARTHWORKS AND LAND CLEARANCE** **Preferred Alternative 1 Layout:** Susceptibility of some areas to erosion because of construction related disturbances due to of vegetation cover and soil disturbance may result in some areas being susceptible to soil erosion after completion of the activity. Bare soils that remain vacant for extended periods of time can result in alien invasive encroachment. Alien invasive species are noted fire hazards.	

	No-Go Alternative: No change to status quo.	
Nature of Impact:	Negative	Not applicable, as the site will remain as it is. No development will occur.
Extent, duration and magnitude of impact:	Local and long-term	
Consequence of impact or risk:	• Bare exposed soils. • Negligent stockpiling of materials.	
Probability of occurrence:	Low - Medium	
Degree to which the impact may cause irreplaceable loss of resources:	Low	
Degree to which the impact can be reversed:	Partly reversible	
Indirect impacts:	• Alien invasive encroachment. • Poor re-establishment of soil horizons during backfilling. • Need to purchase topsoil resulting in additional costs, as a result of loss of topsoil.	
Cumulative impact prior to mitigation:	• Poor rehabilitation due to incorrect backfilling.	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Medium**	
Degree to which the impact can be	Medium - High	

avoided:		
Degree to which the impact can be managed:	Medium	
Degree to which the impact can be mitigated:	Medium	
Proposed mitigation:	General: • Ensure working corridor is demarcated appropriately. • Ensure the working corridor does not exceed 20m's(only if necessary) • Take into account sloped areas. • Be mindful of rainfall events, and plan construction works during dry season. • Ensure programme of works includes rehabilitation after each section has been backfilled, to avoid bare surfaces remaining exposed for extended periods of time. • Ensure ALL works on site, remain within the working corridor (this includes stockpiling, if necessary, on site). • Undertake search and rescue of area demarcated for excavations as per the search and rescue plans. Stockpiling: • Ensure stockpiles do not exceed 2m's in height. • Prohibit stockpiling of material close to slopes. • Ensure stockpiles are bunded, and if necessary, cover with shade cloth to avoid loss of material. • Separate topsoil and subsoils during excavations. • When backfilling, ensure subsoils are backfilled first,	

	and top-soil thereafter. • If topsoil is of poor-quality purchase new topsoil to ensure rehabilitation will be successful. • Remove alien invasives/weeds established on stockpiled soils prior to re-instatement. • Continue with weed management throughout construction, in line with the EMPr. Excavations: • Ensure excavations are undertaken as per specifications. • Ensure that excavations are not left open overnight. If it is necessary to do so, the working corridor demarcation must be checked by the safety officer to ensure that ether is no potential for encroachment by fauna or people. The excavation may need to be covered using metal sheeting or other somewhat rigid cover. • No excavations may be left open overnight if rain is predicted. • Integrate shoring measures if pit walls are collapsing. Exposed surfaces: • Implement weed management measures as detailed in the EMPr. • After backfilling an area, immediately commence with rehabilitation, as detailed in the EMPr, and continue with weed management. • Ensure dust creation is controlled, as detailed in the EMPr. • No surface should be left exposed for extended periods of time.	

	Alien invasive management: • Ensure that alien invasive species are identified, and measures are taken to consistently remove alien invasive species from within the development footprint – implement weed management plan/alien invasive management plan as per EMPr. • Stockpiled alien invasive species cleared from site, should be contained and removed from site as soon as possible, so as to not allow dispersal. • Indigenous vegetation must be utilized where possible. • Implement rehabilitation plan. Erosion Management • Suitable measures must be implemented in areas that are susceptible to erosion. Areas must be rehabilitated, and a suitable cover crop planted once construction is completed. • Topsoil must be stripped and stockpiled separately and replaced on completion. • If natural vegetation re-establishment does not occur, a suitable grass must be applied. • Be mindful of weather conditions that may cause runoff. • Utilize silt fences, if necessary, at demarcated working corridor fence line, to capture runoff. Soil Contamination • Ensure all machinery utilizes drip trays. • Ensure all machinery is maintained prior to allowing them to be utilized on site. • Utilize spill-kit for contaminated soil and dispose of at a registered site.	

	• If cement is to be mixed, ensure this is done on a bunded impermeable surface, and transferred so that there is no interaction with natural ground. • No contaminated soil may be utilized during backfilling. Waste Management • Utilize waste receptacles on site. • Do not litter on site. • Remove waste receptacles positioned outside of site camp, at the end of every day. • Do not allow food wrappers or food items to build up in any waste receptacles as this will attract scavenging fauna, and other pests. Specialist Recommendation: Topsoil • Topsoil shall be removed from all areas where physical disturbance of the surface will occur. • All available topsoil shall be removed after consultation with the Regional Manager prior to commencement of any operations. • The removed topsoil shall be stored on high ground within the footprint outside the 1:50 flood level within demarcated areas. • Topsoil shall be kept separate from overburden and shall not be used for building or maintenance of roads. • The stockpiled topsoil shall be protected from being blown away or being eroded. The use of a suitable grass seed/runner mix will facilitate soil protection and minimise weeds/weed growth.	

	Stormwater and Erosion Control • Stormwater Management Plans must be developed for the site and should include the following: - The management of stormwater during construction. - The installation of stormwater and erosion control infrastructure. - The management of infrastructure after completion of construction. • Temporary drainage works may be required to prevent stormwater to prevent silt laden surface water from draining into river systems in proximity to the site. Stormwater must be prevented from entering or running off site. • To ensure that site is not subjected to excessive erosion and capable of drainage runoff with minimum risk of scour, their slopes should be profiled at a maximum 1:3 gradient. • Diversion channels should be constructed ahead of the open cuts, and above emplacement areas and stockpiles to intercept clean runoff and divert it around disturbed areas into the natural drainage system downstream of the site. • Rehabilitation is necessary to control erosion and sedimentation of all eroded areas (where works will take place). • Existing vegetation must be retained as far as possible to minimise erosion problems. • It is importation that the rehabilitation of site is planned and completed in such a way that the runoff water will not cause erosion. • Visual inspections will be done on a regular basis with regard to the stability of water control structure,	

	erosion and siltation. • Sediment-laden runoff from cleared areas must be prevented from entering rivers and streams. • No river or surface water may be affected by silt emanating from the site. Site Office / Camp Sites • No site offices or camp sites will be constructed on the site under current operating conditions, existing structures will be used. Operating Procedures in the Site • Construction shall only take place within the approved demarcated site. • The Contractor must ensure that an emergency preparedness plan is in place in order to fight accidental fires or veld fires, should they occur. The adjacent landowners/users/managers should also be informed or otherwise involved. • Enclosed areas for food preparation should be provided and the Contractor must strictly prohibit the use of open fires for cooking and heating purposes. • The use of branches of trees and shrubs for fire-making must be strictly prohibited. • The Contractor should take all reasonable and active steps to avoid increasing the risk of fire through their activities on-site. No fires may be lit except at places approved by the ECO. • The Contractor must ensure that the basic fire-fighting equipment is to the satisfaction of the Local Emergency Services. • The Contractor must supply all living quarters, site	

	offices, kitchen areas, workshop areas, materials, stores and any other relevant areas with tested and approved fire-fighting equipment. • Fires and "hot work" must be restricted to demarcated areas. • A braai facility may be considered at the discretion of the Contractor and in consultation with the ECO. The area must be away from flammable stores. All events must be under management's supervision and a fire extinguisher will be immediately available. "Low-smoke" fuels must be used (e.g., charcoal) and smoke control regulations, if applicable, must be considered. • The Contractor must take precautions when working with welding or grinding equipment near potential sources of combustion. Such precautions include having a suitable, tested and approved fire extinguisher immediately at hand and the use of welding curtains. Excavations Whenever any excavation is undertaken, the following procedures shall be adhered to: • Topsoil shall be handled as described in this EMP. • Excavations shall take place only within the approved demarcated site. • Excavations must follow the contour lines where possible. • The construction site will not be left in any way to deteriorate into an unacceptable state. • The excavated area must serve as a final depositing area for waste rock and overburden during the rehabilitation process.	

	• Once excavations have been filled with overburden, rocks and coarse natural materials and profiled with acceptable contours (including erosion control measures), the previous stored topsoil shall be returned to its original depth over the area. • The area shall be fertilised, if necessary, to allow vegetation to establish rapidly. The site shall be seeded with a local or adapted indigenous seed mix in order to propagate the locally occurring flora. Soil Aspects • Sufficient topsoil must be stored for later use during decommissioning, particularly from outcrop areas. • Topsoil shall be removed from all areas where physical disturbance of the surface will occur. • All available topsoil shall be removed after consultation with the botanist and horticulturalist prior to commencement of any operations. • The removed topsoil shall be stored on high ground within the site footprint outside the 1:50 flood level within demarcated areas. • Topsoil shall be kept separate from overburden and shall not be used for building or maintenance of roads. • The stockpiled topsoil shall be protected from being blown away or being eroded. The application of a suitable grass seed/runner mix will facilitate this and reduce the minimise weeds. Rehabilitation of Processing and Excavation Areas • On completion of construction, the surface of the	

	processing areas especially if compacted due to hauling and dumping operations shall be scarified to a depth of at least 200 mm and graded to an even surface condition and the previously stored topsoil will be returned to its original depth over the area • The area shall be fertilised, if necessary, to allow vegetation to establish rapidly. The site shall be seeded with suitable grasses and local indigenous seed mix. • Excavations may be used for the dumping of construction wastes. This shall be done in such a way as to aid rehabilitation. • Waste (non-biodegradable refuse) will not be permitted to be deposited in the excavations. • If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the activity, be corrected and the area be seeded with a vegetation seed mix to his or her satisfaction. This must be done in conjunction with the ECO. • Final rehabilitation must comply with the requirements mention in the Rehabilitation Plan. Monitoring: • Bush clearing - Ensure working plant has no oil or hydraulic leaks - Check delineated footprints area not exceeded • Regular checks on trenches for trapped animals	

	and possible drowning risks • Regular checks of fences for snares	
Residual impacts:		
Cumulative impacts post mitigation:		
Significance rating of impact post mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low**	
Potential impact and risk:	**LOSS OF VEGETATION AND DISRUPTION TO ECOLOGICAL PROCESSES: FYNBOS & FOREST VEGETATION** **Preferred Alternative 1 Layout:** Permanent or temporary loss of indigenous vegetation cover because of site clearing. Site clearing before construction will result in the blanket clearing of vegetation within the affected footprint. Loss of flora species of special concern during pre-construction site clearing activities. Numerous species of special concern are potentially present within the affected area, which could be destroyed during site preparation. Disturbances to ecological processes: Activity may result in disturbances to ecological processes. **No-Go Alternative:** No change to status quo.	
Nature of Impact:	Negative	No change to the status quo.
Extent, duration and magnitude of impact:	Local, short (Fynbos) - long term (Forest) and low intensity (Fynbos) – medium intensity (Forest)	
Consequence of impact or risk:	• Permanent or temporary loss of indigenous vegetation cover. • Loss of flora species of special concern	
Probability of occurrence:	Highly probable	
Degree to which the	High	

impact may cause irreplaceable loss of resources:		
Degree to which the impact can be reversed:	Low	
Indirect impacts:		
Cumulative impact prior to mitigation:	• Disturbances to ecological processes.	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium - High	
Degree to which the impact can be avoided:	Low	
Degree to which the impact can be managed:	Medium	
Degree to which the impact can be mitigated:	Medium	
Proposed mitigation:	Specialist recommendation: • Implement a flora search and rescue before commencement. • Respective permits to be obtained beforehand. Clearance of vegetation: • Blanket clearing of vegetation must be limited to	

	the development footprint, and the area to be cleared must be demarcated before any clearing commences. • No clearing outside of footprint to take place. • Should the pipeline require clearing of forest, respective permits will be required beforehand AND measures must be implemented to minimise such clearing. - Such measures include a survey of the route before commencement in order to microsite the route to avoid large or important trees and may require hand excavation in certain areas to reduce the footprint so as not to significantly disturb the canopy. • Topsoil must be striped and stockpiled separately during site preparation and replaced on completion where revegetation will take place. • Any site camps and laydown areas requiring clearing must be located within already disturbed areas away from watercourses. • Avoid intact forest vegetation pockets where possible. Flora search and Rescue • Once the final layout has been determined the botanist will be consulted in order to finalise the plant relocation and vegetation clearing plan. • Respective permits to be obtained. • Flora search and rescue is to be conducted before vegetation clearing takes place. • Areas should only be stripped of vegetation as and when required and once species of special concern have been relocated for that area.	

	• Once site clearing is to commence, the area to be cleared of vegetation will be surveyed by the vegetation and plant search and rescue team clearing under the supervision of the botanist to identify and remove species suitable for rescue and commence removal of plants. • These species are to be replanted immediately in a suitable area of similar vegetation, where future development is unlikely to occur, or within a protected area. Alien Invasive Vegetation: • Alien species must be removed from the site as per the National Environmental Management: Biodiversity Act (No. 10 of 2004) requirements. • A suitable weed management strategy must be implemented in the construction phase and carried through the operational phase. • Weeds and alien species must be cleared by hand before the rehabilitation phase of the areas. Removal of alien plants are to be done according to the Working for Water Guidelines. • The Contractor is responsible for the removal of alien species within all areas disturbed during construction activities. Disturbed areas include (but are not limited to) access roads, construction camps, site areas and temporary storage areas. • In consultation with relevant authorities, the Engineer may order the removal of alien plants (when necessary). Areas within the confines of the site are to be included. • All alien plant material (including brushwood and seeds) should be removed from site and disposed	

	of at a registered waste disposal site. Should brushwood be utilised for soil stabilization or mulching, it must be seed free. • After clearing is completed, an appropriate cover crop may be required, should natural re-establishment of grasses not take place in a timely manner. Fires • The Contractor must ensure that an emergency preparedness plan is in place in order to fight accidental fires or veld fires, should they occur. The adjacent landowners/users/managers should also be informed or otherwise involved. • Enclosed areas for food preparation should be provided and the Contractor must strictly prohibit the use of open fires for cooking and heating purposes. • The use of branches of trees and shrubs for fire-making must be strictly prohibited. • The Contractor should take all reasonable and active steps to avoid increasing the risk of fire through their activities on-site. No fires may be lit except at places approved by the ECO. • The Contractor must ensure that the basic fire-fighting equipment is to the satisfaction of the Local Emergency Services. • The Contractor must supply all living quarters, site offices, kitchen areas, workshop areas, materials, stores and any other relevant areas with tested and approved fire-fighting equipment. • Fires and "hot work" must be restricted to demarcated areas.	

	• A braai facility may be considered at the discretion of the Contractor and in consultation with the ECO. The area must be away from flammable stores. All events must be under management's supervision and a fire extinguisher will be immediately available. "Low-smoke" fuels must be used (e.g., charcoal) and smoke control regulations, if applicable, must be considered. • The Contractor must take precautions when working with welding or grinding equipment near potential sources of combustion. Such precautions include having a suitable, tested and approved fire extinguisher immediately at hand and the use of welding curtains. Soil Aspects • Sufficient topsoil must be stored for later use during decommissioning, particularly from outcrop areas. • Topsoil shall be removed from all areas where physical disturbance of the surface will occur. • All available topsoil shall be removed after consultation with the botanist and horticulturalist prior to commencement of any operations. • The removed topsoil shall be stored on high ground within the site footprint outside the 1:50 flood level within demarcated areas. • Topsoil shall be kept separate from overburden and shall not be used for building or maintenance of roads. • The stockpiled topsoil shall be protected from being blown away or being eroded. The application of a suitable grass seed/runner mix will facilitate this and reduce the minimise weeds.	

	Dust • To manage complaints relation to impacts on the nearby communities, a dust register will be developed. • If required, water spray vehicles will be used to control wind cause by strong winds during activities on the works. • No over-watering of the site or road surfaces. • Wind screens should be used to reduce wind and dust in open areas.	
Residual impacts:		
Cumulative impacts post mitigation:		
Significance rating of impact post mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Medium - Low**	
Potential impact and risk:	**DISTURBANCE AND DISPLACEMENT OF FAUNAL HABITAT AND FAUNAL SPECIES OF CONSERVATION CONCERN** **Preferred Alternative 1 Layout:** Construction activities could impact on faunal species habitats, which could result in disturbance and displacement of faunal species, their processes. Activities associated with bush clearing can lead to dispersal of species and interactions between labour and fauna such as snakes, that can be perceived as dangerous fauna, may lead to increased mortalities among faunal species. The animal species specialist has confirmed that no SCC due to the nature of the proposed development, the level of habitat transformation and presence of existing impacts along the proposed route, the study area (inclusive a 500m corridor) is of very low sensitivity for terrestrial animal species. **No-Go Alternative:** No change to status quo.	

Nature of Impact:	Negative	
Extent, duration and magnitude of impact:	Local, short term and low intensity	
Consequence of impact or risk:	• Disturbance and displacement of faunal species, their processes.	
Probability of occurrence:	Low	
Degree to which the impact may cause irreplaceable loss of resources:	Low	
Degree to which the impact can be reversed:	Low	
Indirect impacts:		
Cumulative impact prior to mitigation:	• Disturbances to fauna that can be perceived as dangerous fauna, may lead to increased mortalities among faunal species.	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Medium**	
Degree to which the impact can be avoided:	Low	
Degree to which the impact can be managed:	Medium	
Degree to which the	Medium	

impact can be mitigated:		
Proposed mitigation:	General: • Ensure contact numbers for emergency assistance is available. Specialist recommendations: • Blanket clearing of vegetation must be limited to the footprint. • It is important that clearing activities are kept to the minimum and take place in a phased manner, where applicable. This allows any smaller animal species to move into safe areas and prevents wind and water erosion of the cleared areas. • The habitats and microhabitats present on the project site are not unique and are widespread in the general area, hence the local impact associated with the footprint would be of low significance if mitigation measures are adhered to. • Small mammals within the habitat on and around the affected area are generally mobile and likely to be transient to the area. They will most likely vacate the area once construction commences. As with all construction sites there is a latent risk that there will be some accidental mortalities. Specific measures are made to reduce this risk. • The risk of species of special concern is low, and it is unlikely that there will be any impact to populations of such species because of the activity. • Reptiles such as lizards are less mobile compared to mammals, and some mortalities could arise. - It is recommended that a faunal search and rescue be conducted before construction	

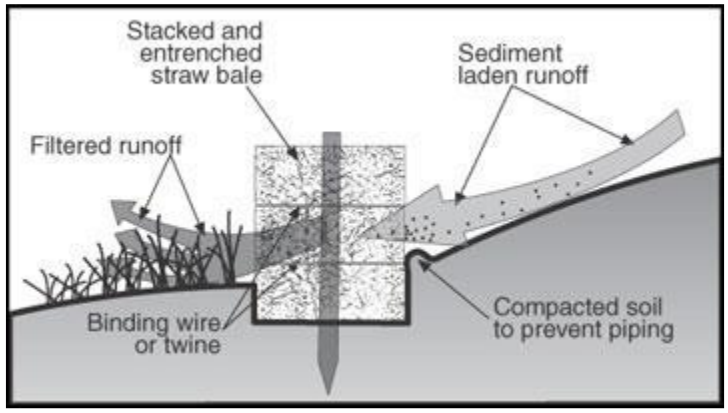
	commences, although experience has shown that there could still be some mortalities as these species are mobile and may thus move onto site once construction is underway. - A reptile handler should be on call for such circumstances. • Should any amphibian migrations occur between wetland areas during construction, appropriate measures (including temporarily suspending works in the affected area) should be implemented. • A pre-commencement faunal search and rescue is recommended. • Respective permits to be obtained beforehand (if applicable). • No animals are to be harmed or killed during the course of operations. • Workers are NOT allowed to snare any faunal species. • Indigenous vegetation encountered on the sites that are to be conserved and left intact. • It is important that clearing activities are kept to the minimum and take place in a phased manner. This allows animal species to move into safe areas and prevents wind and water erosion of the cleared areas. • Stripped vegetation should be temporarily stored during operations and to be used later to stabilise slopes. This excludes exotic invasive species. • No animals are to be harmed or killed during the course of operations. • Workers are NOT allowed to collect any flora or snare any faunal species. All flora and fauna remain the property of the landowner and must not be	

	disturbed, upset or used without their expressed consent. • It is the responsibility of the Contractor to provide sufficient fuel for cooking and heated as needed by the staff. • No domestic animals are permitted on the sites. • Trees and shrubs that are directly affected by the operations may be felled or cleared but only by the expressed written permission of the ECO. • Rehabilitation of vegetation of the site must be done as described in the Rehabilitation Plans.	
Residual impacts:		
Cumulative impacts post mitigation:		
Significance rating of impact post mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low**	
Potential impact and risk:	**AQUATIC IMPACTS** **Preferred Alternative 1 Layout:** Impacts on the 4 identified watercourse features may include: loss of watercourse habitat and ecological structure resulting in impacts to biota; changes to the socio-cultural and service provision; impacts on the hydrology and sediment balance of the wetland; and impacts on water quality. This may occur during site preparation, vehicular movement of construction materials, excavation and trenching, stockpiling soils, removal of vegetation and associated disturbances to soils, all leading to loss of vegetation, habitat and ecosystem services; increased risks of sedimentation/erosion; and soil and stormwater contamination. **No-Go Alternative:** No change to status quo.	

	*Refer to Appendix J for extract of actual tables from specialist report.	
Nature of Impact:	Negative	
Extent, duration and magnitude of impact:	Site Specific and Medium term	
Consequence of impact or risk:	• Loss of watercourse vegetation, associated habitat and ecosystem services, associated with the trench footprint areas and associated construction area; • Transportation of construction materials can result in disturbances to soils, and increased risk of sedimentation/erosion; and • Soil and stormwater contamination from oils and hydrocarbons originating from construction vehicles. • Earthworks could be potential sources of sediment, which may be transported as runoff into the downstream watercourse areas;	
Probability of occurrence:	Probable, except in the case of Hol River (as a pipe bridge will be utilized)	
Degree to which the impact may cause irreplaceable loss of resources:	Marginal (Ephemeral drainage) - Nil	
Degree to which the impact can be reversed:	Completely reversible	
Indirect impacts:	• Proliferation of alien and/or invasive vegetation as a result of disturbances. • Increased sedimentation of the watercourses, leading to smothering of vegetation associated with the watercourses; and	

	• Exposure of soils, leading to increased runoff, and erosion, and thus increased sedimentation of the watercourses; • Altered watercourse habitat; • Altered runoff patterns, leading to increased erosion and sedimentation of the watercourses.	
Cumulative impact prior to mitigation:	Low	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium – High (Ephemeral drainage) to Low	
Degree to which the impact can be avoided:	Medium (Ephemeral drainage) - high	
Degree to which the impact can be managed:	Medium (Ephemeral drainage) - high	
Degree to which the impact can be mitigated:	Possible	
Proposed mitigation:	Specialist recommendations: Site preparation prior to construction activities: • It is imperative that all construction works be undertaken during the dry summer months during low flows when flow diversion is not necessary; • Due to the accessibility of the sites, no unnecessary crossing of the watercourses may be permitted and	

	all existing roads must be utilised to limit edge effects, erosion and sedimentation of the watercourses during the construction phase; • The reaches of the watercourses where no activities are planned to occur must be considered no-go areas. These no-go areas can be marked from a maximum distance of 5 m upstream and downstream of the proposed crossing in the watercourse. This 5 m construction area around the trenching site would allow for construction personal, vehicles (if applicable) to enter the watercourse and install the pipelines; • Contractor laydown areas, vehicle re-fuelling areas and material storage facilities to remain outside of the watercourses and their associated 32 m NEMA Zone of Regulation (ZoR); • Construction vehicles that are not in use must be parked outside of watercourses and be equipped with drip trays to avoid potential spillage into adjacent watercourses; • The removed vegetation must be stockpiled outside of the delineated boundary of the watercourses. The footprint areas of these stockpiles should be kept to a minimum. Should the vegetation not be suitable for reinstatement after the construction phase or be alien/invasive vegetation species, all material must be disposed of at a registered garden refuse site and may not be burned or mulched on site. Installation of the new water pipelines: • It is imperative that all construction works be undertaken during the dry summer months during	

	low flows when no diversion of flow would be necessary. If diversion of flow is required, the following control measures must be implemented: - Open trenching should be done in a phased manner, in half width sections across the applicable watercourse; - All proposed activities will potentially result in bank destabilisation, and cause bank incision and sedimentation of the watercourse, therefore, sediment control devices (such as silt traps) should be installed in place prior to diverting the flow (an example of a silt trap is provided below);  - Ensure that the creation of any required diversion (by means of sandbags) does not result in a significant water level difference upstream or downstream of the installation site; - The diversion sandbags should be filled with material from the watercourse so as to prevent foreign material to be introduced to the river; - At least two sandbag berms should be placed	

	between the running water of the watercourse and the open trench (specific for the riparian systems). After the temporary diversion is constructed and diversion of water occurs, one half of trench length can be excavated; - The duration of impacts within the watercourse should be minimised as far as possible by ensuring that the duration of time in which flow alteration and sedimentation will take place is minimised. Therefore, the construction period should be kept as short as possible; - Topsoil must be stockpiled separately from the rest of the excavated material and be replaced once the pipelines are installed. The footprint areas of these stockpiles should be kept to a minimum and may not exceed a height of 2m. - During trenching through the watercourses, soils must be stockpiled upgradient of the trench. Mixture of the lower and upper layers of the excavated soil should be kept to a minimum. These soils must be used to close off the trenches, immediately after inserting the pipelines. The stockpiles must remain as small as possible and may not exceed 2m in height;	

	 • Protect exposed soils and stockpiles from wind, and limit the time in which soils are exposed, by covering with a suitable geotextile such as hessian sheeting; • Material used as bedding material (at the bottom of the excavated trench) should be stockpiled outside of the delineated boundary of the watercourse until trenches are ready for placement. Once the trench has been excavated, gabion walls and mattresses (as necessary) can be installed, and the bedding material should directly be placed within the trench rather than stockpiling it alongside the trench; • The bedding layer (such as clean gravel) should be spread evenly and compacted uniformly to the required density using a hand tamper (one man operator) in order to minimise the use of large machinery within the watercourse; • Once the pipeline has been installed, the stockpiled soils should be used as backfill for the trench. The trench should be filled with soil in the same sequence as it was removed; • All excavated trenches must be compacted to	

	natural soil compaction levels to prevent the formation of preferential surface flow paths and subsequent erosion. Conversely, areas compacted as a result of construction activities (within the 5m buffer zone) must be loosened to natural soil compaction levels; • Any remaining soils following the completion of backfilling of the trenches are to be spread out thinly in an area within the watercourses to aid in the natural reclamation process; • The construction footprint must be limited to the width of the trench and an additional 5m buffer (to allow for the stockpiling and movement of personnel). The area must be rehabilitated after the completion of the construction phase, including revegetation thereof with indigenous watercourse vegetation. In addition, alien vegetation eradication of the footprint area must be undertaken.	
Residual impacts:		
Cumulative impacts post mitigation:	Low (Ephemeral drainage) – no significance	
Significance rating of impact post mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low**	
Potential impact and risk:	**SOCIAL IMPACT: VISUAL** **Alternative 1 Layout Plan:** Excavations and earthworks during construction result in alteration of the sense of place	

	and will result in visual impacts. Other visual impacts may occur from negligent stockpiling, bad housekeeping of site camp, and negligence within the working corridor, as well as failing to pursue rehabilitation timeously. Furthermore, the development in some cases may be visible from the N2, however given the topography and need to be set beyond the road reserve, the impact on the N2 is minimal, and temporary in terms of the pipeline. **No-Go Alternative**: No visual impacts are proposed, as the status quo will persist.	
Nature of Impact:	Negative	Not applicable as the status quo will persist, therefore no visual impacts will be observed.
Extent, duration and magnitude of impact:	Local and temporary.	
Consequence of impact or risk:	• Change of visual aesthetics, due to construction disturbance.	
Probability of occurrence:	Definite	
Degree to which the impact may cause irreplaceable loss of resources:	No loss of resource.	
Degree to which the impact can be reversed:	Irreversible	
Indirect impacts:	None	
Cumulative impact prior to mitigation:	None	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium - Low	
Degree to which the impact can be avoided:	Unavoidable	

Degree to which the impact can be managed:	Low - Medium	
Degree to which the impact can be mitigated:	Can be partly mitigated	
Proposed mitigation:	General: • The site camp, toilets, storage facilities, stockpiles, waste bins, and any other temporary structures on site, should be located in such a way that they will present as little visual impact to surrounding residents and road users as possible. • Utilize shade cloth, or other suitable material, along the fence perimeter of the site camp and construction working corridor. • Work on site must be well-planned and well-managed so that work proceeds quickly and efficiently, thus minimizing the disturbance time. • Special attention should be given to the screening of highly reflective material. • Use of lighting (if required) should take into account surrounding residents and land users and should present little or no nuisance. Downward facing, spill-off type lighting is recommended. Vegetation Clearance • Ensure working corridor fence is established before proceeding. • Ensure search and rescue is undertaken by specialist. • Rehabilitate immediately after backfilling, and monitor the area as recommended in the EMPr. Heavy Machinery	

	• Heavy machinery must remain within fenced areas. • Do not maintain heavy machinery on site or on permeable surfaces. Stockpiling • Separate subsoils and topsoils. • The topsoil must be stored separately and should not be contaminated. • The soil layers should be replaced in the same order and the topsoil returned last. • Topsoil stockpiles must be less than 1.5m in height and have adequate signage to illustrate which are topsoil and subsoil for rehabilitation purpose. • Clear litter/waste/weeds from topsoil prior to backfilling. • Import topsoil if topsoil is found to be inadequate to support rehabilitation. • Do not allow stockpiled material to exceed 2m's in height, and do not position stockpiles along slopes or outside of the working corridor/site camp. Stormwater measures • Utilize temporary stormwater structures, eg: silt fences, to capture runoff before it creates erosion down slopes.	
Residual impacts:	None.	
Cumulative impacts post mitigation:	None	
Significance rating of impact post mitigation (e.g. Low, Medium, Medium-High, High, or	**Low**	

Very-High)		
Potential impact and risk:	**SOCIO-ECONOMIC IMPACTS – CREATION OF MULTIPLE JOB OPPORTUNITIES & CAPITAL EXPENDITURE** **Alternative 1 Layout Plan:** Creation of multiple, temporary job opportunities for skilled and unskilled labour, with potential for skills transfer, for members of the local community. Goods, materials and services, should be sourced from local businesses. **No-Go Alternative:** No additional jobs created, even temporarily.	
Nature of Impact:	Positive	Negative
Extent, duration and magnitude of impact:	Local and medium - term.	Local and temporary
Consequence of impact or risk:	• Labourers (unskilled), will be able to earn a living. • Labourers (unskilled) can improve/build their skills. • Improved quality of life for these labourers, by establishing an income.	• No temporary employment.
Probability of occurrence:	Definite	Definite
Degree to which the impact may cause irreplaceable loss of resources:	No loss of a resources	Low
Degree to which the impact can be reversed:	Irreversible	Irreversible
Indirect impacts:	• Income generated by labourer will benefit their families/households, by improving the quality of their lives. • There may be opportunities to transfer skills from more experienced workers to less experienced workers. • Local community/shops will benefit, as labour	• No opportunity for skills transfer/earning a living (even temporary), or the potential for improving ones quality of life. • No supplies will be needs therefore materials and supplies will not be sourced locally, therefore no additional benefit to the local economy.

	purchases goods through income generated, from local suppliers.	
Cumulative impact prior to mitigation:	Medium (+)	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	High (+)	Low (-)
Degree to which the impact can be avoided:	Unavoidable	Unavoidable
Degree to which the impact can be managed:	Not applicable	Not applicable
Degree to which the impact can be mitigated:	No mitigation proposed, as it is a positive impact.	No potential mitigation as there would be no development.
Proposed mitigation:	• Positive, therefore no mitigation necessary. • It should be noted that this impact will benefit the local community and address the issue of unemployment within the Western Cape, and country of South Africa, particularly for unskilled labourers, although temporary. • The applicant is recommended to source local labour, contractors and sub-contractors, as well as utilize local materials and suppliers.	
Residual impacts:	• Labour that previously lacked construction skills and experience, who were hired for this project, will now be able to utilize this for future developments.	
Cumulative impacts		

post mitigation:		
Significance rating of impact post mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**High (+)**	Low (-)
Potential impact and risk:	**SOCIAL IMPACT: TRAFFIC & ACCESS** **Alternative 1 Layout Plan:** In terms of the N2, the pipeline crossing at the tie-in point will not create significant impacts, as pipe jacking is proposed. Vehicles transporting heavy machinery and materials may create traffic along the N2, as the N2 is along this portion of Kurland is a two-lane road. Access onto individual properties does exist, however this can lead disgruntled landowners, if the construction vehicles create obstruction across the access roads. **No-Go Alternative:** No change to status quo.	
Nature of Impact:	Negative	Not applicable, as no development will take place, the status quo will persist.
Extent, duration and magnitude of impact:	Local, short-term and minor	
Consequence of impact or risk:	• Some congestion may occur on Stella Road, when delivery vehicles enter and exit site with materials.	
Probability of occurrence:	Low-medium	
Degree to which the impact may cause irreplaceable loss of resources:	No loss of resource.	
Degree to which the impact can be reversed:	Barely	
Indirect impacts:	• Accidents may occur due to impatient or negligent drivers.	

	• Congestion and delays.	
Cumulative impact prior to mitigation:	• Possible complaints from public traversing this road, daily.	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low - Medium	
Degree to which the impact can be avoided:	Low	
Degree to which the impact can be managed:	Medium	
Degree to which the impact can be mitigated:	Can be mitigated	
Proposed mitigation:	General: • Plan deliveries ahead of time, such as abnormal loads, to occur outside of peak traffic periods. • All construction vehicles need to adhere to traffic laws. The speed of construction vehicles and other heavy vehicles must be strictly controlled to avoid dangerous conditions for other road users. As far as possible care should be taken to ensure that the local traffic flow pattern is not significantly disrupted. • All vehicle operators need to be educated in terms of "best-practice" operations to minimise unnecessary traffic congestion or dangers. Construction vehicles should therefore, not	

	unnecessarily obstruct the access point or traffic lanes used to access the site. • Adequate signage, that is both informative and cautionary to passing traffic (motorists and pedestrians), warning them of the construction activities must be suitably located in the area where the construction is occurring and must be easily visible by all road users. • If needed, appropriate traffic management measures and/ or points men (traffic marshals) should be utilized to assist vehicles entering/ exiting the site, particularly where vehicles must cross the path of oncoming traffic. • Speed of construction vehicles and other heavy vehicles must be strictly controlled to avoid dangerous conditions for other road users.	
Residual impacts:	None.	
Cumulative impacts post mitigation:	Negligible.	
Significance rating of impact post mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low.**	
Potential impact and risk:	**SECURITY AND VANDALISM** **Alternative 1 Layout Plan:** Construction activities or opportunities for work, stockpiled materials, etc. can attract people with nefarious intentions. **No-Go Alternative:** No change to status quo	

Nature of Impact:	Negative	Not applicable, as the status quo will persist.
Extent and duration of impact:	Local & short term	
Consequence of impact or risk:	• Damage to or loss of resources.	
Probability of occurrence:	Highly unlikely	
Degree to which the impact may cause irreplaceable loss of resources:	High	
Degree to which the impact can be reversed:	Irreversible	
Indirect impacts:		
Cumulative impact prior to mitigation:		
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low - Medium	
Degree to which the impact can be avoided:	Medium – High	
Degree to which the impact can be managed:	Medium – High	
Degree to which the impact can be mitigated:	Medium - High	

Proposed mitigation:	General • Ensure access to site is controlled and restricted. • A register must be kept of all vehicles and personnel entering the site. • At night, ensure that materials are covered/obstructed from view.	
Residual impacts:		
Cumulative impacts post mitigation:		
Significance rating of impact post mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low**	

	OPERATIONAL PHASE		
	PREFERRED ALTERNATIVE 1 LAYOUT	**No-Go**	
Potential impact and risk:	**AQUATIC IMPACTS: WATER QUALITY AND IMPEDANCE OF FLOW** **Alternative Layout Plan 1:** Potential leakage of water from the pipeline can lead to impacts on the water quality, and possible incision and alteration of the hydroperiod of the watercourse, which can lead to a potential decrease in a portion of the water sustaining the watercourse. **No-Go Alternative:** No change to the status quo. *Refer to Appendix J for extract of actual tables from specialist report.		
Nature of Impact:	Negative	Not applicable, as the status quo will persist.	
Extent, duration and magnitude of impact:	Local – site specific and long-term		

Consequence of impact or risk:	• Possible incision and alteration of the hydroperiod of the watercourse and potential impacts to the water quality. • Can lead to a decrease in the portion of the water sustaining the watercourse.	
Probability of occurrence:	Probable – Improbable (Hol River)	
Degree to which the impact may cause irreplaceable loss of resources:	Low	
Degree to which the impact can be reversed:	Partly - completely	
Indirect impacts:		
Cumulative impact prior to mitigation:		
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Medium**	
Degree to which the impact can be avoided:	Low - High	
Degree to which the impact can be managed:	Medium	
Degree to which the impact can be mitigated:	Medium - High	

Proposed mitigation:	Specialist Recommendation: • It is recommended that the integrity of the water pipelines be tested at least once every five years or more often should there be any sign of a leak; • It should be ensured that the hydrological regime of the watercourses are not impacted as a result of leaks or bursting of the pipeline, and that an emergency plan should be compiled to ensure a quick response and attendance to the matter in case of a leakage or bursting of the pipeline; • Should repair of the pipeline be required to address a leak, mitigations as per activity 2 and 3 above as applicable depending upon the location of the leak should be applied. • The open trench method should ensure that the backfilled soil is compacted to a density characteristic of the natural surrounding area and all buried bulk water infrastructure should not be installed within 500 m of the surface so as to minimise impedance of interflows.	
Residual impacts:	None	
Cumulative impacts post mitigation:	None	
Significance rating of impact post mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low**	
Potential impact and	**ALIEN INVASIVE SPECIES CLEARANCE AND REHABILIATION**	

risk:	**Alternative Layout Plan 1:** On-going maintenance must be a priority of the applicant. Rehabilitation plan must be implemented and monitored by the contractor and ECO as recommended in the EMPr. **No-Go Alternative:** No change to the status quo.	
Nature of Impact:	Negative	No change to the status quo.
Extent, duration and magnitude of impact:	Limited to site	
Consequence of impact or risk:	• Reoccurrence of alien invasive species.	
Probability of occurrence:	High	
Degree to which the impact may cause irreplaceable loss of resources:	Low - medium	
Degree to which the impact can be reversed:	Medium – High	
Indirect impacts:	• Further degradation of natural area. • Fire risk, due to the presence of alien invasive species.	
Cumulative impact prior to mitigation:		
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low - Medium (-)	
Degree to which the	Medium – High	

impact can be avoided:		
Degree to which the impact can be managed:	Medium – High	
Degree to which the impact can be mitigated:	Medium – High	
Proposed mitigation:	Specialist Recommendation: • Implement the Rehabilitation and Landscaping Plan: - On completion of construction, the surface of any work areas, especially if compacted due to hauling and dumping operations shall be scarified to a depth of at least 200 mm and graded to an even surface condition and the previously stored topsoil will be returned to its original depth over the area. - The disturbed areas can be seeded with suitable grasses and local indigenous seed mix, if deemed to be required, however, vegetation is likely to re-establish without input. - Excavations may not be used for the dumping of construction wastes. - Waste (non-biodegradable refuse) will not be permitted to be deposited in the excavations and must be disposed of appropriately. - Final rehabilitation must comply with the requirements mentioned in the Rehabilitation Plan. • Implement the Maintenance Management Plan: - Ongoing maintenance is likely to be required in	

	the long-term, which could include re-excavation of portions of the pipeline for maintenance/replacement of defective components and leak repair where applicable. All measures of this report, including the EMPr should be adhered for any such maintenance requirements. Any excavated areas must be stabilised and rehabilitated as per the measures indicated in this report.	
Residual impacts:	None	
Cumulative impacts post mitigation:	None	
Significance rating of impact post mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low (-)**	
Potential impact and risk:	**SOCIO-ECONOMIC IMPACTS: BOOSTING LOCAL REVENUE AND LOCAL ECONOMY** **Alternative Layout Plan 1:** Kurland is dominated by farm portions, nature reserves and small community nodes. Tourism plays a big part in the local economy. The Western Cape has historically experienced drought conditions that has impacted upon various sectors including tourism, as a reliable water supply is essential to the hospitality industry. By creating a reliable water supply to the Kurland area, the tourism industry is supported, and boosted and in future can grow, creating more jobs, salaries and overall improvement of people's quality of life and the local economy. **No-Go Alternative:** No change to the status quo.	
Nature of Impact:	Positive	
Extent, duration and magnitude of impact:	Local and long-term	
Consequence of	• Businesses, especially those in the tourism sector are	

impact or risk:	more efficiently supported, as this essential service is upgraded.	
Probability of occurrence:	Highly likely	
Degree to which the impact may cause irreplaceable loss of resources:	Low	
Degree to which the impact can be reversed:	Irreversible	
Indirect impacts:		
Cumulative impact prior to mitigation:	As businesses grow and become more stable, they are able to employ more people, this can lead to: • Sourcing local employees of various skill levels. • Employees are able to earn a living to improve the lives, health and safety of their family members and households. • Employees are able to afford to educate their children. • Employees are able to provide food and shelter for themselves and their families. • Employment created with the development will have a positive influence on members in the community previously unemployed. Employees will source goods from the local community, contributing to the local economy. • Opportunity for skills transfer and growth for employees.	
Significance rating of impact prior to	Low (+)	

mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)		
Degree to which the impact can be avoided:	Not applicable, it remains a positive impact.	
Degree to which the impact can be managed:		
Degree to which the impact can be mitigated:		
Proposed mitigation:		
Residual impacts:		
Cumulative impacts post mitigation:		
Significance rating of impact post mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low (+)**	
Potential impact and risk:	**SOCIO-ECONOMIC IMPACTS: PROVISION UPGRADED SERVICES AND INFRASTRUCTURE** **Alternative Layout 1:** The proposal will provide upgrades to the existing bulk water supply which will prolong the lifespan of this network and ensure service delivery is optimized, even as new development occurs in and around the Kurland area. By providing clean drinking water, the municipality is ensuring that the citizens of Kurland have access to this vital resource, for years to come. **No-Go Alternative:** No change to status quo.	
Nature of Impact:	Positive	• No negative or positive impacts are predicted

Extent, duration and magnitude of impact:	Positive	
Consequence of impact or risk:	• Meeting the demand for water in the Kurland area. • Supporting existing communities and proposed future development in the area. • Utilizing existing infrastructure.	
Probability of occurrence:	• Definite	
Degree to which the impact may cause irreplaceable loss of resources:	Low	
Degree to which the impact can be reversed:	Irreversible	
Indirect impacts:		
Cumulative impact prior to mitigation:		
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	High (+)	
Degree to which the impact can be avoided:	Unavoidable	
Degree to which the impact can be managed:	Unmanageable.	
Degree to which the impact can be	N/A – This is a positive impact proposed to be enhanced.	

mitigated:		
Proposed mitigation:	• Positive, no mitigation required. • The proposed development represents an enhancement measure on its own.	
Residual impacts:	Positive: • Meeting the need for community services within the municipality. • Promoting economic growth and interest for the municipality, as basic community services are available.	
Cumulative impacts post mitigation:		
Significance rating of impact post mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**High (+)**	
Potential impact and risk:	**SOCIAL IMPACT: VISUAL** **Alternative Layout 1:** Sense of place will be permanently altered at the locations identified for the new pump station and reservoir, however the pipeline will be situated below ground indicating, and the area backfilled and rehabilitated. Failure to rehabilitate correctly can leave area bare and alien invasive species may thrive. **No-Go Alternative**: No alterations will occur therefore no visual impacts are proposed.	
Nature of Impact:	Negative	In terms of Section 28 of the National Environmental Management Act, 1998 (Act 107 of 1998), Duty of Care, the site must be maintained by the landowner, and all possible sources of pollution of harm, should be removed including alien invasive species.
Extent, duration and magnitude of impact:	Local and permanent	
Consequence of impact or risk:	Change in sense of place	
Probability of occurrence:	Definite	

Degree to which the impact may cause irreplaceable loss of resources:	No irreplaceable loss of resources.	
Degree to which the impact can be reversed:	Irreversible	
Indirect impacts:	Change in sense of place.	
Cumulative impact prior to mitigation:		
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low	
Degree to which the impact can be avoided:	Medium	
Degree to which the impact can be managed:	Medium	
Degree to which the impact can be mitigated:	Medium	
Proposed mitigation:	General: • Utilize natural colours and non-reflective material for the pump station and reservoir. • Rehabilitate the area within the servitude area of the pump station and reservoir. • Follow-rehabilitation plan, and ensure that the all alien invasives are cleared and indigenous cover is	

	successful.	
Residual impacts:	• None	
Cumulative impacts post mitigation:		
Significance rating of impact post mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low**	
Potential impact and risk:	**CLIMATE CHANGE CONSIDERATIONS** **Alternative Layout 1:** Risks of climate change includes increase in temperatures, reduction in rainfall, sea-level rise, increased fire incidents, and increased frequency of storm events. All adaption measures found to be feasible and reasonable must be integrated and implemented. All relevant feasible and reasonable climate mitigation measures that were adopted must be implemented. On-going monitoring taking into account the anticipated climate risks, is a necessity. **No-Go Alternative**: No upgrades to the system will occur, therefore, the existing issues will persist, and the aged infrastructure will be vulnerable to climate change impacts.	
Nature of Impact:	Negative	Negative
Extent, duration and magnitude of impact:	Local – Regional and long-term	
Consequence of impact or risk:	• Positive Impacts: - Increase in temperatures will mean that the Kurland residents and visitors, will need more clean drinking water, this proposal will meet this need by providing a reliable source of water to the community and to the Kurland area. - By providing access to clean drinking water, communities, especially those without basic services, will not need to depend on watercourses,	- Strain on services, as temperatures increase. - Strain on water resources. - The need to capture and store rainwater during periods of rainfall, will become a priority. - Will impact negatively on groundwater capacity and availability. - Fires can be started by negligent labour activity. Which in turn can affect private properties, homes, and livelihoods (farms), etc.

	thereby relieving the burden on these natural features. - Improving the quality of life for people, as well as providing a chance at a healthy life, as clean drinking water is a necessity. - This proposal will ensure that an efficient supply of water is available, which can also be utilized in the event of a fire incident. - As water will be available, there is a higher chance that the fires can be controlled and put out as soon as possible, which will ensure minimal harm to infrastructure and human health. - Majority of the pipelines will be below ground, unless fixed to a structure, such as a bridge. This will help avoid damage to this infrastructure during such events. By securing this infrastructure, after storm events, the communities and residents will at the very least have access to clean water, while managing the negative impacts that may have occurred. This is a significant socio-economic benefit, as the lack of water and electricity, especially following catastrophic storm events, can exacerbate the negative impact on human health. • Negative Impacts: - Strain on services, as temperatures increase. - Strain on water resources. - The need to capture and store rainwater during periods of rainfall, will become a priority. - Will impact negatively on groundwater capacity and availability. - Fires can be started by negligent labour activity. Which in turn can affect private properties, homes,	- Based on the variety of vegetation intended to be traversed by this proposal, drier periods may see fire hazards occurring beyond the control of the contractor or farmers, which can put lives and infrastructure at risk. - Potential for the storm event to damage infrastructure, at water crossings, and at extraction points, as well as at exposed infrastructure (ie. reservoirs and pump stations). - Potential for storm events to impact on electricity supply, which will strain the functioning of pumps and other electrical devices, designed to ensure that the treatment and supply of water is undertaken correctly.

	and livelihoods (farms), etc. - Based on the variety of vegetation intended to be traversed by this proposal, drier periods may see fire hazards occurring beyond the control of the contractor or farmers, which can put lives and infrastructure at risk. - Potential for the storm event to damage infrastructure, at water crossings, and at extraction points, as well as at exposed infrastructure (ie. reservoirs and pump stations). - Potential for storm events to impact on electricity supply, which will strain the functioning of pumps and other electrical devices, designed to ensure that the treatment and supply of water is undertaken correctly.	
Probability of occurrence:	Probable	Highly Probable
Degree to which the impact may cause irreplaceable loss of resources:	Marginal loss of resources.	Significant loss of resources.
Degree to which the impact can be reversed:	Partly reversed	Partly reversed
Indirect impacts:	Impacts on the community and their livelihoods.	Significant impacts the community and their livelihoods.
Cumulative impact prior to mitigation:	• Damage to infrastructure • Loss of businesses	
Significance rating of impact prior to mitigation	Low - Medium	High

(e.g. Low, Medium, Medium-High, High, or Very-High)		
Degree to which the impact can be avoided:	Medium	Low
Degree to which the impact can be managed:	Medium	Low - Medium
Degree to which the impact can be mitigated:	Medium	Low - Medium
Proposed mitigation:	• Implement all adaption and mitigation measures found to be feasible and reasonable. • Monitor efficiency of all adaption and mitigation measures, during operational phase.	• Implement mitigation measures where possible.
Residual impacts:	None	Potential for impacts to occur, as upgrades will not be undertaken, therefore aged infrastructure remains, and no additional capacity will be accommodated for.
Cumulative impacts post mitigation:		
Significance rating of impact post mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low**	**High**

SECTION I: FINDINGS, IMPACT MANAGEMENT AND MITIGATION MEASURES

1.	Provide a summary of the findings and impact management measures identified by all Specialist and an indication of how these findings and recommendations have influenced the proposed development.

TERRESTRIAL BIODIVERSITY & BOTANICAL IMPACT ASSESSMENT:

Summary of Findings:

Sensitivity	***Status***	***Reference Sections for the Preferred 200mm Rising Main (S of the N2)***	***Reference Sections for the Alternative 200mm Rising Main (N of the N2)***
Low	Portions of the site that are completely transformed or severely degraded, that have a low conservation status, or where there is very dense alien infestation. Loss of these areas will not significantly compromise the current conservation status of the vegetation unit at a regional level, nor is its loss likely to compromise the ecological functioning of surrounding areas.	• Portion of #3; • #4 -#5 • Portion of #6; • Portion of #7 • Portion of #9; • #10	• Portion of #3; • #4 -#5 • Portion of #6; • Portion of #8 • Portion of #9;
Moderate	Portions of natural vegetation that is mostly intact, but not having specific biodiversity related issues of significance or where proposed activity will have limited overall impact and recovery will be good with minimal intervention. Moderate sensitivity areas include intact fynbos vegetation in less disturbed areas, as well as marginal forest vegetation.	• #1 and #2 • Portion of #3	• #1 and #2 • Portion of #3 • Portion of #8; • Portion of #9 • #10
High	Those areas having intact vegetation and deemed to have a sensitivity, including being within intact Critical Biodiversity Areas and connectivity corridors, or are deemed critical habitat for fauna and/or flora species that are considered to be vulnerable and/or have confirmed presence of species of conservation concern. High sensitivity terrestrial areas on site include intact forest pockets as	• Portion of #7; • Portion of #8; • Portion of #9.	• #7

	well as around watercourses.		
Very High / No-Go Areas	(No-Go Areas) include areas having a Critically Endangered or Endangered conservation status, or that are irreplaceable in terms of Critical Biodiversity Areas or are critical habitat for any faunal species that is endangered or critically endangered.	For the purposes of this assessment **no specific Very High sensitivity terrestrial areas have been identified.**	
	No specific no go-areas have been identified, however the preferred pipeline alternative from upper Matjiesfontein pump station to the Kurland tie-in does cross through several watercourses and forest pockets as well as through a small dam in the vicinity of the Kiaruna Private Nature Reserve. In order for this route to be acceptable, some revisions would be recommended. The watercourse crossing should not exceed standard design requirements for such a crossing and stormwater and erosion measures are recommended.	Several watercourses and forest pockets as well as through a small dam in the vicinity of the Kiaruna Private Nature Reserve	

Two distinct vegetation types are represented on the site – fynbos with several sub-units and forest. It is evident that portions of the pipeline route site are heavily degraded, particularly within the fynbos areas in proximity to the N2 National Road and associated road reserve and to a lesser extent in or surrounding forest patches. While the pipeline route does traverse several distinct fynbos units, it is noted that the units represented to share several species and this is evident in the road reserve and areas adjacent to this road reserve, where a clear differentiation between the units is not always possible.

It is concluded that much of the pipeline route, where in proximity to the road, is comprised of a somewhat homogenous secondary fynbos vegetation with variable degrees of degradation from alien invasion. The road reserve is largely comprised of secondary vegetation, as this area would have been cleared when the road was constructed, and or significantly invaded vegetation, which extends to some extent into the area directly adjacent to the road reserve.

Forest is present in several patches and tends to either extend up to the fence that demarcated the road reserve or has densely invaded fynbos and/or a fynbos with forest or thicket elements. The following key characteristic support this conclusion:

- The most at risk vegetation unit (Garden Route Shale Fynbos) is designated a Vulnerable status (NBA 2018), which indicates it is under threat but can withstand further loss. The remaining vegetation units that are represented all have a least concern status, including the forest. Development of the pipeline, which will most likely rehabilitate after completion of construction in fynbos areas within 2 years, is unlikely to compromise regional conservation targets due to this rehabilitation but also due to the limited footprint of the pipeline within the regional context. Forest vegetation is unlikely to rehabilitate effectively after completion of construction, thus any removal of forest would be considered

permanent or long term.

- The Western Cape Biodiversity Spatial Plan designates two key Critical Biodiversity corridors in proximity to the site, the first at the southern end of the pipeline, in proximity to the existing Matjiesfontein reservoir and the second in the vicinity of the Kiaruna Private Nature Reserve approximately midway along the pipeline. Both corridors correspond to forest corridors, with the southern one notably a mozaic between patches of forest and fynbos. Ecological Process Area are designated more widely but tend to correspond to less intact patches of vegetation surrounding these main corridors. Notably, the N2 national corridor provides a significant disruption to this corridor and most of the disturbed areas directly adjacent to this corridor are designated Ecological Process Area. The proposed pipeline will primarily fall within such areas, except for a few patches where is does extend into CBA designated patches. Ecological Support Areas are not required to meet conservation targets and the land use guidelines indicate that some habitat loss is acceptable. Since most of the proposed activity (pipeline) is considered to be temporary, any habitat loss would also be temporary and in the medium to long-term, any ecological disturbances are likely to be reversed (specifically within fynbos and not forest).
- The permanent features associated with the pipeline include the proposed new Matjiesfontein pump station, the proposed new Upper Matjiesfontein pump station and an extension to the existing Kurland WTW. Although permanent, all of these are located within areas already significantly disturbed and furthermore have a limited footprint. The ecological impact associated with these structures, although permanent, is this considered to be minimal and within acceptable limits.
- A small dam (artificial wetland) is present on the Kiaruna Private Nature Reserve that is traversed by the pipeline, which is not feasible and would require re-routing, depending on the findings of the aquatic assessment.
- The vegetation on site is representative of the respective vegetation nits, however it is noted that much of it is secondary and thus clear differentiation is not always possible as the most common elements are those that are common to all the represented units.
- Removal and fragmentation of forest patches on the preferred alternative from upper Matjiesfontein pump station to the Kurland tie-in in the vicinity of the Kiaruna Private Nature Reserve will result in a cumulative loss of forest, which although not having an elevated status currently is protected in terms of the National Forests Act. These forest pockets are protected in terms of the National Forests Act, and an opinion will be required from the respective forestry authority to clarify if they will allow the activity (i.e. will permits top remove such forest be possible). Alternative options may need further considerations for the affected portion depending on the outcome of this consultation.

Summary of Impacts:

All impacts are assessed to be of low to moderate significance after mitigation. Impacts include:

- Loss of vegetation and disruption to ecological processes.
- Disturbance and displacement of faunal habitat and faunal species of conservation concern.
- Disturbance of flora species of conservation concern.

Summary of Management Measures:

- Vegetation
  - Blanket clearing of vegetation must be limited to the site. No clearing outside of footprint to take place.
  - Should the pipeline require clearing of forest, respective permits will be required beforehand AND measures must be implemented to minimise such clearing. Such measures include a survey of the route before commencement in order to microsite the route to avoid large or important trees and may require hand excavation in certain areas

to reduce the footprint so as not to significantly disturb the canopy.
  - Topsoil must be striped and stockpiled separately during site preparation and replaced on completion where revegetation will take place.
  - Any site camps and laydown areas requiring clearing must be located within already disturbed areas away from watercourses.
- Flora Species
  - A flora search and rescue is recommended before commencement.
  - Respective permits to be obtained beforehand.
- Alien Invasive Species
  - Alien trees and weeds must be removed from the site as per CARA/NEMBA requirements.
  - A suitable weed management strategy to be implemented in construction and operation phases.
  - After clearing and construction is completed, an appropriate cover may be required, should natural re-establishment of grasses not take place in a timely manner along road verges. This will also minimise dust.
- Erosion
  - Suitable measures must be implemented in areas that are susceptible to erosion. Areas must be rehabilitated, and a suitable cover crop planted once construction is completed.
  - Topsoil must be stripped and stockpiled separately and replaced on completion.
  - If natural vegetation re-establishment does not occur, a suitable grass must be applied.
- Ecological Processes
  - Blanket clearing of vegetation must be limited to the development footprint, and the area to be cleared must be demarcated before any clearing commences.
- Aquatic and Riparian processes
  - Suitable structures to be constructed at watercourse crossings that do not alter flows.
  - Stormwater discharge into watercourses to be protected against erosion.
- Faunal Habitat, Processed and Species
  - Blanket clearing of vegetation must be limited to the footprint.
  - It is important that clearing activities are kept to the minimum and take place in a phased manner, where applicable. This allows any smaller animal species to move into safe areas and prevents wind and water erosion of the cleared areas.
  - The habitats and microhabitats present on the project site are not unique and are widespread in the general area, hence the local impact associated with the footprint would be of low significance if mitigation measures are adhered to.
  - Small mammals within the habitat on and around the affected area are generally mobile and likely to be transient to the area. They will most likely vacate the area once construction commences. As with all construction sites there is a latent risk that there will be some accidental mortalities. Specific measures are made to reduce this risk. The risk of species of special concern is low, and it is unlikely that there will be any impact to populations of such species because of the activity.
  - Reptiles such as lizards are less mobile compared to mammals, and some mortalities could arise. It is recommended that a faunal search and rescue be conducted before construction commences, although experience has shown that there could still be some mortalities as these species are mobile and may thus move onto site once construction is underway. A retile handler should be on call for such circumstances.
  - Should any amphibian migrations occur between wetland areas during construction, appropriate measures (including temporarily suspending works in the affected area) should be implemented.
  - A pre-commencement faunal search and rescue is recommended.
  - Respective permits to be obtained beforehand.
  - No animals are to be harmed or killed during the course of operations.
  - Workers are NOT allowed to snare any faunal species.

Recommendations and Influence on Proposed Development:
It is the conclusion of this terrestrial biodiversity assessment that the proposed pipeline and associated infrastructure (pump stations and reservoir) can be constructed within acceptable terrestrial biodiversity impact limits providing the recommended mitigation actions are adhered to.

- The implementation of the management actions relating to flora and fauna as well erosion and stormwater management and post construction rehabilitation will minimise biodiversity impacts.
- Should the pipeline require clearing of forest, respective permits will be required beforehand AND measures must be implemented to minimise such clearing. Such measures include a survey of the route before commencement in order to microsite the route to avoid large or important trees and may require hand excavation in certain areas to reduce the footprint so as not to significantly disturb the canopy.

It is the conclusion of this terrestrial biodiversity assessment that due to the limited footprint and temporary nature of the proposed activity; it can be constructed within the fynbos areas without significantly compromising the broader ecological processes, nor the conservation status of the vegetation units bearing in mind specific positioning of the components within the landscape and current levels of degradation.

The removal and clearing of forest will however increase the impacts and alternatives may require further investigation. Of the options proposed, it is recommended that the least impact option would be the preferred Matjiesfontein to new upper Matjiesfontein pipeline and the alternative upper Matjiesfontein to Kurland tie-in routes. The alternative Matjiesfontein to new upper Matjiesfontein pipeline on the north side of the N2 will follow a steep slope adjacent to the N2 and will thus require more significant earthworks which would increase impact. The preferred upper Matjiesfontein to Kurland tie-in will traverse several forest pockets and will extend some distance from the N2 road, which will result in elevated disruptions to ecological processes and fragmentation of forest, which is not an advisable option. The alternative upper Matjiesfontein to Kurland tie-in will also traverse a forest pocket but will be near its edge. This can be further reduced by moving the pipeline from 6 m from the edge of the road reserve to the edge of the road reserve, which will result in minimal forest loss and no further fragmentation of significance. The forest in this section on the north side of the N2 national road extend to the current road reserve fence and also the proposed pipeline route does not extend as far away from this edge. If it were possible to shift the pipeline from 6 m to along the fence, it would result in removal of trees from the edge of the forest rather than cutting a new line through, which would also limit the impact and fragmentation. Alternatively, it is recommended that vegetation clearing and trench excavation within these forest areas be done by hand or with the use of less destructive construction plant. Final routing through any forest patches will determine the final species impact, as it will depend on the specific trees that are impacted or require removal, which will be permanent. It is recommended that a micro-siting process be undertaken before plan finalisation and construction with a land surveyor and botanist, in order to minimise impact as far as possible.

While indigenous fynbos species including species of conservation concern are present on the site, it can be concluded that these indigenous species occupy a small proportion of the site compared to that of the exotic (i.e., non-indigenous) and common widespread species. The species that are present, are largely within a secondary context and thus would more than likely re-establish on completion of construction, with implementation of mitigation measures.

TERRESTRIAL ANIMAL SPECIES COMPLIANCE STATEMENT:

Summary of Findings:
According to the Terrestrial Animal Species Compliance Statement, it was concluded that due to the

nature of the proposed development, the level of habitat transformation and presence of existing impacts along the proposed route, the study area is of very low sensitivity for terrestrial animal species, and SCC. There is a noted potential loss of habitat, due to destruction during construction resulting in disturbance and displacement of potential SCC, however the specialist confirmed this is a temporary impact; and given this short-lived impact, narrow proposed developmental footprint and proximity to existing impacts (N2 national highway, agricultural- and recreational land use) potential SCC will be able to easily move into the surrounding natural habitat and return once construction is completed.

Summary of Impacts:

- None

Summary of Management Measures:

- None

Recommendations and Influence on Proposed Development:

As proposed development will not likely have a significant negative impact on the long-term viability or persistence of terrestrial animal SCC in the area and the proposed development can be approved from a Terrestrial Animal Species perspective with no conditions to which this compliance statement is subjected.

AQUATIC COMPLIANCE STATEMENT:

Summary of Findings:

Following the ecological assessment of the watercourses, the DWS Risk Assessment Matrix (2016) was applied in order to ascertain the significance of possible impacts which may occur as a result of the proposed bulk water infrastructure. The results of this assessment show that assuming mitigation measures are strictly enforced, a 'Low' risk to the overall integrity of the riparian systems is expected and a 'Moderate' risk to the overall integrity of the wetlands is expected. The DEAT 2002 and 2006 informed impact assessment determined that impacts carry low impacts post mitigation provided that adequate mitigation is applied as required.

In considering the two alternative pipelines for the 200 mm supply pipeline from the Matjiesfontein reservoir to the proposed upper Matjiesfontein reservoir, it is the opinion of the specilaist that either pipeline alternative route will have similar impacts to the identified watercourses as both alternatives remain within close proximity to the N2 road and traverse similar watercourses (ephemeral drainage lines). It is noted that Alternative 1 is the preferred option, however from a freshwater resource management perspective Alternative 2 is considered more preferrable as it traverses less ephemeral drainage lines than Alternative 1.

The proposed development intersects both the 32 m ZoR (NEMA) and the 100m/500 m ZoR (NWA) which would necessitate the application for Environmental Authorisation from the Department of Environmental Affairs and Development Planning (DEA&DP), and Water Use Authorisation from the Breede-Gouritz Catchment Management Agency (BGCMA).

Summary of Impacts:

- Loss of watercourse habitat and ecological structure resulting in impacts to biota;
- Changes to the socio-cultural and service provision;
- Impacts on the hydrology and sediment balance of the wetland; and
- Impacts on water quality.

Summary of Management Measures:

Construction:

- Site preparation prior to construction activities:
  - All construction works be undertaken during the dry summer months during low flows when flow diversion is not necessary;
  - Due to the accessibility of the sites, no unnecessary crossing of the watercourses may be permitted and all existing roads must be utilised to limit edge effects, erosion and sedimentation of the watercourses during the construction phase;
  - The reaches of the watercourses where no activities are planned to occur must be considered no-go areas. These no-go areas can be marked from a maximum distance of 5 m upstream and downstream of the proposed crossing in the watercourse. This 5 m construction area around the trenching site would allow for construction personal, vehicles (if applicable) to enter the watercourse and install the pipelines;
  - Contractor laydown areas, vehicle re-fuelling areas and material storage facilities to remain outside of the watercourses and their associated 32 m NEMA Zone of Regulation (ZoR);
  - Construction vehicles that are not in use must be parked outside of watercourses and be equipped with drip trays to avoid potential spillage into adjacent watercourses;
  - The removed vegetation must be stockpiled outside of the delineated boundary of the watercourses. The footprint areas of these stockpiles should be kept to a minimum. Should the vegetation not be suitable for reinstatement after the construction phase or be alien/invasive vegetation species, all material must be disposed of at a registered garden refuse site and may not be burned or mulched on site.

- Installation of the new water pipelines:
  - It is imperative that all construction works be undertaken during the dry summer months during low flows when no diversion of flow would be necessary. If diversion of flow is required, the following control measures must be implemented:
    - Open trenching should be done in a phased manner, in half width sections across the applicable watercourse;
    - All proposed activities will potentially result in bank destabilisation, and cause bank incision and sedimentation of the watercourse, therefore, sediment control devices (such as silt traps) should be installed in place prior to diverting the flow (an example of a silt trap is provided below);
    - Ensure that the creation of any required diversion (by means of sandbags) does not result in a significant water level difference upstream or downstream of the installation site;

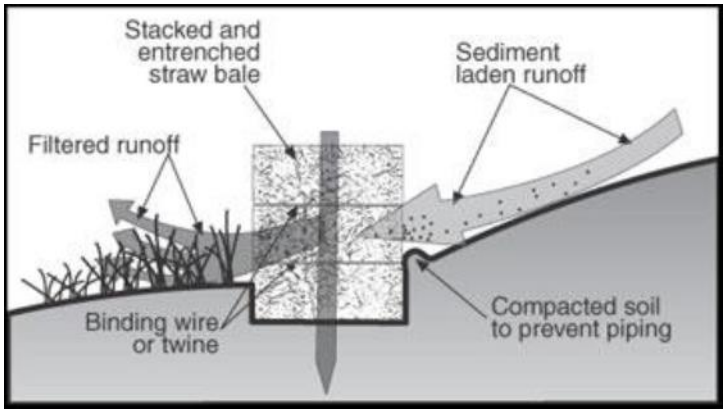


Figure 50: Example of a silt trap that can be used during construction, specifically for the wetlands

    - The diversion sandbags should be filled with material from the watercourse so as to

prevent foreign material to be introduced to the river;
    - At least two sandbag berms should be placed between the running water of the watercourse and the open trench (specific for the riparian systems). After the temporary diversion is constructed and diversion of water occurs, one half of trench length can be excavated;
- The duration of impacts within the watercourse should be minimised as far as possible by ensuring that the duration of time in which flow alteration and sedimentation will take place is minimised. Therefore, the construction period should be kept as short as possible;
- Topsoil must be stockpiled separately from the rest of the excavated material and be replaced once the pipelines are installed. The footprint areas of these stockpiles should be kept to a minimum and may not exceed a height of 2m.
- During trenching through the watercourses, soils must be stockpiled upgradient of the trench (Figure 51). Mixture of the lower and upper layers of the excavated soil should be kept to a minimum. These soils must be used to close off the trenches, immediately after inserting the pipelines. The stockpiles must remain as small as possible and may not exceed 2m in height;

Figure 51: An example of a trench being excavated, and the removed soil stockpiled along the upgradient slope of the trench.

- Protect exposed soils and stockpiles from wind, and limit the time in which soils are exposed, by covering with a suitable geotextile such as hessian sheeting;
- Material used as bedding material (at the bottom of the excavated trench) should be stockpiled outside of the delineated boundary of the watercourse until trenches are ready for placement. Once the trench has been excavated, gabion walls and mattresses (as necessary) can be installed, and the bedding material should directly be placed within the trench rather than stockpiling it alongside the trench;
- The bedding layer (such as clean gravel) should be spread evenly and compacted uniformly to the required density using a hand tamper (one man operator) in order to minimise the use of large machinery within the watercourse;
- Once the pipeline has been installed, the stockpiled soils should be used as backfill for the trench. The trench should be filled with soil in the same sequence as it was removed;
- All excavated trenches must be compacted to natural soil compaction levels to prevent the formation of preferential surface flow paths and subsequent erosion. Conversely, areas compacted as a result of construction activities (within the 5m buffer zone) must be loosened to natural soil compaction levels;
- Any remaining soils following the completion of backfilling of the trenches are to be spread out thinly in an area within the watercourses to aid in the natural reclamation process;
- The construction footprint must be limited to the width of the trench and an additional 5m buffer (to allow for the stockpiling and movement of personnel). The area must be rehabilitated after the completion of the construction phase, including revegetation

thereof with indigenous watercourse vegetation. In addition, alien vegetation eradication of the footprint area must be undertaken.

Operational:

- Operation of Water Pipes
  - It is recommended that the integrity of the water pipelines be tested at least once every five years or more often should there be any sign of a leak;
  - It should be ensured that the hydrological regime of the watercourses are not impacted as a result of leaks or bursting of the pipeline, and that an emergency plan should be compiled to ensure a quick response and attendance to the matter in case of a leakage or bursting of the pipeline;
  - Should repair of the pipeline be required to address a leak, mitigations as per the construction related measures above as applicable depending upon the location of the leak should be applied
  - The open trench method should ensure that the backfilled soil is compacted to a density characteristic of the natural surrounding area and all buried bulk water infrastructure should not be installed within 500 m of the surface so as to minimise impedance of interflows.

Recommendations and Influence on Proposed Development:

Based on the findings of the watercourse assessments and the results of the risk and impact assessment, it is the opinion of the specialist that the proposed activities pose a low to moderate risk to the integrity of the watercourses provided that adherence to cogent, well-conceived and ecologically sensitive construction plans are implemented and the mitigation measures provided in this report as well as general good construction practice are adhered to. Therefore, the proposed activities are considered acceptable.

AGRICULTURAL COMPLIANCE STATEMENT:

Summary of Findings:

The impact of the proposed development on the agricultural production capability of the site is assessed as being acceptable. This is because the actual pipeline route has little agricultural production potential due to its location mostly along a road, and because of the temporary nature of the linear impact.

Summary of Impacts:

- None

Summary of Management Measures:

- None

Recommendations and Influence on Proposed Development:

The agricultural impact of the proposed development is in-significant and, from an agricultural impact point of view, it is recommended that the development be approved.

2.	List the impact management measures that were identified by all Specialist that will be included in the EMPr

Botanical Specialist:

Summary of Management Measures:

- Vegetation
  - Blanket clearing of vegetation must be limited to the site. No clearing outside of footprint to take place.
  - Should the pipeline require clearing of forest, respective permits will be required beforehand AND measures must be implemented to minimise such clearing. Such

measures include a survey of the route before commencement in order to microsite the route to avoid large or important trees and may require hand excavation in certain areas to reduce the footprint so as not to significantly disturb the canopy.
    - Topsoil must be striped and stockpiled separately during site preparation and replaced on completion where revegetation will take place.
    - Any site camps and laydown areas requiring clearing must be located within already disturbed areas away from watercourses.
- Flora Species
    - A flora search and rescue is recommended before commencement.
    - Respective permits to be obtained beforehand.
- Alien Invasive Species
    - Alien trees and weeds must be removed from the site as per CARA/NEMBA requirements.
    - A suitable weed management strategy to be implemented in construction and operation phases.
    - After clearing and construction is completed, an appropriate cover may be required, should natural re-establishment of grasses not take place in a timely manner along road verges. This will also minimise dust.
- Erosion
    - Suitable measures must be implemented in areas that are susceptible to erosion. Areas must be rehabilitated, and a suitable cover crop planted once construction is completed.
    - Topsoil must be stripped and stockpiled separately and replaced on completion.
    - If natural vegetation re-establishment does not occur, a suitable grass must be applied.
- Ecological Processes
    - Blanket clearing of vegetation must be limited to the development footprint, and the area to be cleared must be demarcated before any clearing commences.
- Aquatic and Riparian processes
    - Suitable structures to be constructed at watercourse crossings that do not alter flows.
    - Stormwater discharge into watercourses to be protected against erosion.
- Faunal Habitat, Processed and Species
    - Blanket clearing of vegetation must be limited to the footprint.
    - It is important that clearing activities are kept to the minimum and take place in a phased manner, where applicable. This allows any smaller animal species to move into safe areas and prevents wind and water erosion of the cleared areas.
    - The habitats and microhabitats present on the project site are not unique and are widespread in the general area, hence the local impact associated with the footprint would be of low significance if mitigation measures are adhered to.
    - Small mammals within the habitat on and around the affected area are generally mobile and likely to be transient to the area. They will most likely vacate the area once construction commences. As with all construction sites there is a latent risk that there will be some accidental mortalities. Specific measures are made to reduce this risk. The risk of species of special concern is low, and it is unlikely that there will be any impact to populations of such species because of the activity.
    - Reptiles such as lizards are less mobile compared to mammals, and some mortalities could arise. It is recommended that a faunal search and rescue be conducted before construction commences, although experience has shown that there could still be some mortalities as these species are mobile and may thus move onto site once construction is underway. A retile handler should be on call for such circumstances.
    - Should any amphibian migrations occur between wetland areas during construction, appropriate measures (including temporarily suspending works in the affected area) should be implemented.
    - A pre-commencement faunal search and rescue is recommended.

- Respective permits to be obtained beforehand.
- No animals are to be harmed or killed during the course of operations.
- Workers are NOT allowed to snare any faunal species.

Aquatic Specialist
Summary of Management Measures:

Construction:

- Site preparation prior to construction activities:
  - All construction works be undertaken during the dry summer months during low flows when flow diversion is not necessary;
  - Due to the accessibility of the sites, no unnecessary crossing of the watercourses may be permitted and all existing roads must be utilised to limit edge effects, erosion and sedimentation of the watercourses during the construction phase;
  - The reaches of the watercourses where no activities are planned to occur must be considered no-go areas. These no-go areas can be marked from a maximum distance of 5 m upstream and downstream of the proposed crossing in the watercourse. This 5 m construction area around the trenching site would allow for construction personal, vehicles (if applicable) to enter the watercourse and install the pipelines;
  - Contractor laydown areas, vehicle re-fuelling areas and material storage facilities to remain outside of the watercourses and their associated 32 m NEMA Zone of Regulation (ZoR);
  - Construction vehicles that are not in use must be parked outside of watercourses and be equipped with drip trays to avoid potential spillage into adjacent watercourses;
  - The removed vegetation must be stockpiled outside of the delineated boundary of the watercourses. The footprint areas of these stockpiles should be kept to a minimum. Should the vegetation not be suitable for reinstatement after the construction phase or be alien/invasive vegetation species, all material must be disposed of at a registered garden refuse site and may not be burned or mulched on site.

- Installation of the new water pipelines:
  - It is imperative that all construction works be undertaken during the dry summer months during low flows when no diversion of flow would be necessary. If diversion of flow is required, the following control measures must be implemented:
    - Open trenching should be done in a phased manner, in half width sections across the applicable watercourse;
    - All proposed activities will potentially result in bank destabilisation, and cause bank incision and sedimentation of the watercourse, therefore, sediment control devices (such as silt traps) should be installed in place prior to diverting the flow (an example of a silt trap is provided below);
    - Ensure that the creation of any required diversion (by means of sandbags) does not result in a significant water level difference upstream or downstream of the installation site;

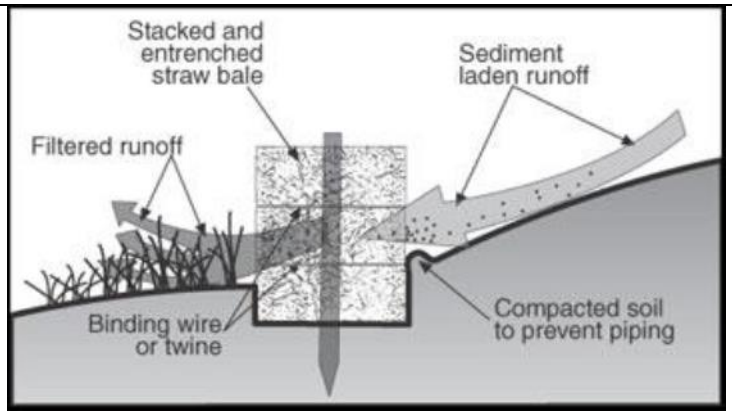


Figure 52: Example of a silt trap that can be used during construction, specifically for the wetlands

  - The diversion sandbags should be filled with material from the watercourse so as to prevent foreign material to be introduced to the river;
  - At least two sandbag berms should be placed between the running water of the watercourse and the open trench (specific for the riparian systems). After the temporary diversion is constructed and diversion of water occurs, one half of trench length can be excavated;
- The duration of impacts within the watercourse should be minimised as far as possible by ensuring that the duration of time in which flow alteration and sedimentation will take place is minimised. Therefore, the construction period should be kept as short as possible;
- Topsoil must be stockpiled separately from the rest of the excavated material and be replaced once the pipelines are installed. The footprint areas of these stockpiles should be kept to a minimum and may not exceed a height of 2m.
- During trenching through the watercourses, soils must be stockpiled upgradient of the trench (Figure 51). Mixture of the lower and upper layers of the excavated soil should be kept to a minimum. These soils must be used to close off the trenches, immediately after inserting the pipelines. The stockpiles must remain as small as possible and may not exceed 2m in height;

Figure 53: An example of a trench being excavated, and the removed soil stockpiled along the upgradient slope of the trench.

- Protect exposed soils and stockpiles from wind, and limit the time in which soils are exposed, by covering with a suitable geotextile such as hessian sheeting;
- Material used as bedding material (at the bottom of the excavated trench) should be stockpiled outside of the delineated boundary of the watercourse until trenches are ready for placement. Once the trench has been excavated, gabion walls and mattresses (as necessary) can be installed, and the bedding material should directly be placed within the trench rather than stockpiling it alongside the trench;

- The bedding layer (such as clean gravel) should be spread evenly and compacted uniformly to the required density using a hand tamper (one man operator) in order to minimise the use of large machinery within the watercourse;
- Once the pipeline has been installed, the stockpiled soils should be used as backfill for the trench. The trench should be filled with soil in the same sequence as it was removed;
- All excavated trenches must be compacted to natural soil compaction levels to prevent the formation of preferential surface flow paths and subsequent erosion. Conversely, areas compacted as a result of construction activities (within the 5m buffer zone) must be loosened to natural soil compaction levels;
- Any remaining soils following the completion of backfilling of the trenches are to be spread out thinly in an area within the watercourses to aid in the natural reclamation process;
- The construction footprint must be limited to the width of the trench and an additional 5m buffer (to allow for the stockpiling and movement of personnel). The area must be rehabilitated after the completion of the construction phase, including revegetation thereof with indigenous watercourse vegetation. In addition, alien vegetation eradication of the footprint area must be undertaken.

Operational:

- Operation of Water Pipes
  - It is recommended that the integrity of the water pipelines be tested at least once every five years or more often should there be any sign of a leak;
  - It should be ensured that the hydrological regime of the watercourses are not impacted as a result of leaks or bursting of the pipeline, and that an emergency plan should be compiled to ensure a quick response and attendance to the matter in case of a leakage or bursting of the pipeline;
  - Should repair of the pipeline be required to address a leak, mitigations as per the construction related measures above as applicable depending upon the location of the leak should be applied
  - The open trench method should ensure that the backfilled soil is compacted to a density characteristic of the natural surrounding area and all buried bulk water infrastructure should not be installed within 500 m of the surface so as to minimise impedance of interflows.

3.	List the specialist investigations and the impact management measures that will **not** be implemented and provide an explanation as to why these measures will not be implemented.

The Terrestrial Biodiversity Assessment recommends that the portions of the pipeline be moved out of the forested areas, toward the road reserve, in order to avoid disturbance to this area. However, this is not possible, given the limitations set forth by the SANRAL road reserve. The alternative measures recommended to reduce the working footprint and utilize labour will be enforced.

4.	Explain how the proposed development will impact the surrounding communities.

Positive Impacts on the Surrounding Community:

- Temporary alteration to surfaces.
- No long-term visual impacts from the pipeline.
- Temporary job creation, with opportunity for skill building and skills transfer.
- Support to local economy, including sourcing from local suppliers, and appointing local labour.
- Improved service delivery and relevant infrastructure.

Negative Impacts on the Surrounding Community:

- Temporary noise, dust and traffic generation during construction.

5.	Explain how the risk of climate change may influence the proposed activity or development and how has the potential impacts of climate change been considered and addressed.

According to the Western Cape Department of Environmental Affairs and Development Planning, climate change will affect the Western Cape in the following ways:

- Higher average annual temperature; Higher maximum temperatures; More hot days and more heat waves; Higher minimum temperatures; Fewer cold days and frost days
- Reduced average rainfall in the Western Cape, particularly the western parts
- Rising sea levels
- Increased fire risks
- Increase in the frequency and intensity of extreme weather events, including floods, droughts, and storm surges

Taking each of these potential risks into consideration, the EAP has recommended the following adaption and mitigation measures, based on the anticipated impacts:

- Higher average annual temperature; Higher maximum temperatures; More hot days and more heat waves; Higher minimum temperatures

- Positive Impacts:
    - Increase in temperatures will mean that the Kurland residents and visitors, will need more clean drinking water, this proposal will meet this need by providing a reliable source of water to the community and to the Kurland area.
    - By providing access to clean drinking water, communities, especially those without basic services, will not need to depend on watercourses, thereby relieving the burden on these natural features.
    - Improving the quality of life for people, as well as providing a chance at a healthy life, as clean drinking water is a necessity.

- Negative Impacts:
    - Strain on services, as temperatures increase.
    - Strain on water resources.

- Adaption Measures:
    - The design must take into consideration that potential higher temperatures may result in an increase in water demand. This must be taken into consideration in the design and planning phase.
    - Where possible feasible alternative sources of raw water must be sourced, to supplement the water demand.
    - Boreholes should be monitored efficiently to ensure that whether or not the water demand increases, there is no strain on boreholes, that may compromise their capacity and integrity.

- Mitigation Measures to Apply during Construction:
    - Daily assessment of weather conditions should be completed during construction stage, to ensure conditions are viable for labourers to be working outside (ie: temperatures are not excessive).
    - Potable water should be available for consumption during construction, to keep labourers hydrated.
    - Ensure that a safety officer is always on site and ensuring that working conditions are acceptable and safe.

- Reduced average rainfall in the Western Cape, particularly the western parts

- Negative Impacts:
    - Strain on services, the need to capture and store rainwater during periods of rainfall, will become a priority.
    - Will impact negatively on groundwater capacity and availability.

- Adaption Measures:
    - The design must take into consideration that rainfall capturing and storage may need considered in future.
    - Where possible feasible alternative sources of raw water must be sourced, to supplement the water demand.
    - Boreholes should be monitored efficiently to ensure that whether or not the water demand increases, there is no strain on boreholes, that may compromise their capacity and integrity.

- Mitigation Measures to Apply during Construction:
    - Daily assessment of weather conditions should be completed during construction stage, to ensure conditions are viable for labourers to be working outside (ie: temperatures are not excessive).
    - Potable water should be available for consumption during construction, to keep labourers hydrated.
    - Ensure that a safety officer is always on site and ensuring that working conditions are acceptable and safe.
    - Implement rainwater capturing system for temporary storage of water to be utilized for washing tools, etc.
    - Utilize hand sanitizer for washing hands.
    - Request that labour use their own water bottles, to be filled up, rather than drinking from taps.

- Rising sea levels

- No impacts are anticipated. The proposed development is positioned approximately and at least 1km inland.

- Increased Fire Risk

- Positive Impacts:
    - This proposal will ensure that an efficient supply of water is available, which can also be utilized in the event of a fire incident.
    - As water will be available, there is a higher chance that the fires can be controlled and put out as soon as possible, which will ensure minimal harm to infrastructure and human health.

- Negative Impacts:
    - Fires can be started by negligent labour activity. Which in turn can affect private properties, homes, and livelihoods (farms), etc.
    - Based on the variety of vegetation intended to be traversed by this proposal, drier periods may see fire hazards occurring beyond the control of the contractor or farmers, which can put lives and infrastructure at risk.

- Adaption Measures:
    - Position fire safety equipment at all proposed reservoir sites.
    - Establish non-smoking signage at all reservoir and pump station sites, to remind maintenance teams that this activity must be avoided.

- Mitigation Measures to Apply during Construction:
    - During development fires should be strictly prohibited, smoking must be discouraged on site. (If the Contractor allows this activity there must be a designated area within the site camp, with an appropriate bin to contain discarded cigarettes, with an appropriately heavy cover, only permitted within the site camp where it can be controlled) No smoking is permitted within the working corridor.
    - If security is positioned on site, at night, they must be briefed on fire hazard risks.
    - During construction no uncontrolled fires are allowed.
    - Ensure emergency numbers are readily available with a working cell-phone on site, and if construction teams are split, the foreman responsible for each team is to ensure that he has these emergency numbers, and can contact emergency services immediately.

- Increase in the frequency and intensity of extreme weather events, including floods, droughts, and storm surges.

- Positive Impacts:
    - Majority of the pipelines will be below ground, unless fixed to a structure, such as a bridge. This will help avoid damage to this infrastructure during such events. By securing this infrastructure, after storm events, the communities and residents will at the very least have access to clean water, while managing the negative impacts that may have occurred. This is a significant socio-economic benefit, as the lack of water and electricity, especially following catastrophic storm events, can exacerbate the negative impact on human health.

- Negative Impacts:
    - Potential for the storm event to damage infrastructure, at water crossings, and at extraction points, as well as at exposed infrastructure (ie. reservoirs and pump stations).
    - Potential for storm events to impact on electricity supply, which will strain the functioning of pumps and other electrical devices, designed to ensure that the treatment and supply of water is undertaken correctly.

- Adaption Measures:
    - The design must take into consideration that potential for storm surges to impact on infrastructure and its function. Measures to consider includes:
        - Encase (potentially concrete) pipelines situated through watercourse beds, so that even if exposed in storm surge events, the pipeline is protected. Alternatively, utilize reno mattresses to cover buried pipeline.
        - Consider integrating solar panels into the design of infrastructure, which require electrical sources to function.
        - Future designs, where possible, must consider feasible alternative sources for raw water, to supplement the water demand.
    - Boreholes should be monitored efficiently to ensure that whether or not the water demand increases, there is no strain on boreholes, that may compromise their capacity and integrity.
    - All infrastructure should be maintained and monitored after significant storm events.

- Mitigation Measures to Apply during Construction:
    - Apply designs as specified by engineer.
    - An appropriately experienced and qualified site engineer should monitor the implementation of the proposed design.

The proposal will strive to achieve sustainability. In terms of the Sustainable Development Goals, the following goals are significant to the proposed development and will be addressed to some extent, while others are not relevant.

Significance to development	SDG	Relevance
Significant to Development	SDG 6 SDG 9	Direct – the proposal will establish appropriate infrastructure for clean drinking water supply, as well as raw water transportation and treatment.
	SDG 14 SDG 15	Direct – specialist input has been sourced to address the natural environments that will be directly impacted upon by the development, and where necessary, appropriate mitigation has been applied, to significantly reduce the impacts on the environments.
Relevant links to the Development	SDG 1 SDG 2 SDG 3 SDG 5: SDG 8	Indirect – The proposed construction phase, will require a significant number of labour, of all genders, and various skill sets, especially labour with limited skillsets, to establish the infrastructure. This will create a significant number of jobs, over a years', which will generate salaries. These salaries will provide for the employees, as well as their families, not only allowing the employee but their families to experience an improved quality of life. These salaries not only feed families, but help maintain homes, clothe, and educate children. Labour will have the opportunity to improve their skillsets, so that they may grow, and have other opportunities in the future. Further to this, labour purchase goods from shops and other locals suppliers, which in turn supports the local economy.
	SDG 10	Indirect – It will be recommended that majority of the labour, be sourced locally from the Kurland community, and especially from historically disadvantaged backgrounds. As significant number of labour will be required.
	SDG 7	Indirect – Consideration will be given to alternative energy sources to be integrated into the proposed upgrades, to supplement energy consumption, where possible.
	SDG 11	Indirect – The proposed development will integrate improved infrastructure, by providing additional reservoirs, pump stations and other improvements to the treatment, sourcing and supply process. Goods will be sourced locally, to support local economy and reduce travel costs.
	SDG 12	Indirect – Waste management has been addressed in this proposal, and where possible re-use and recycling has been emphasized. Furthermore, in terms of consumption, boreholes have been investigated, and only where deemed necessary, was this considered for integration, so as to not strain existing ground water resources.
	SDG 13	Indirect – Climate change considerations have been

		recommended.
Limited Relevance/ not Relevant	SDG 4; 16 and 17	

6.	Explain whether there are any conflicting recommendations between the specialists. If so, explain how these have been addressed and resolved.

No. Although the Terrestrial Biodiversity Assessment does assess impacts on riparian and aquatic environments as well as faunal impacts, this is addressed in a general manner, while the specific specialists assessed specific aspects of the aquatic and animal themes and concluded similarly.

7.	Explain how the findings and recommendations of the different specialist studies have been integrated to inform the most appropriate mitigation measures that should be implemented to manage the potential impacts of the proposed activity or development.

The findings and recommendations have been integrated into the impact tables (Section H, of this document), and the EMPr, so as to guide the various phases of the project.

8.	Explain how the mitigation hierarchy has been applied to arrive at the best practicable environmental option.

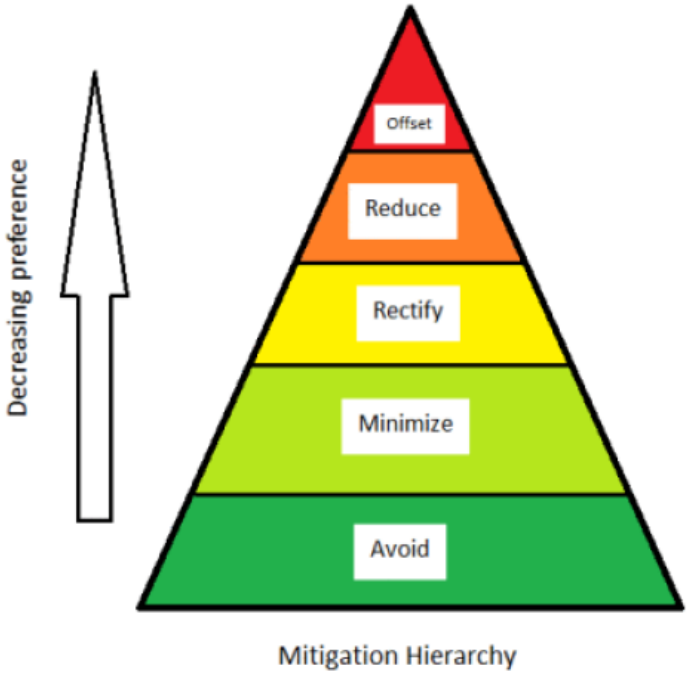


Figure 54: Mitigation Hierarchy.

The Mitigation Hierarchy was considered while determining the best practicable environmental option for the proposed development. Activities related to the proposed development/renovations have been considered. Where possible activities have been avoided, therefore all activities included in the proposal of this development are essential for the successful implementation and operation of this development.

All impacts that could not be avoided, have been investigated to establish mitigation measures to minimize and rectify, where possible or radically reduce the predicted impacts. As all the proposed impacts can be sufficiently reduced in significance, and no residual negative biodiversity impacts will remain, no biodiversity offset was considered for this development.

SECTION J: GENERAL

1. Environmental Impact Statement

1.1.	Provide a summary of the key findings of the EIA.

The key findings of the EIA indicate that the proposed development, has significant positive impacts and all negative impacts can be significantly mitigated with reasonable and practical mitigation measures, these can be summarised below:

SOCIO-ECONOMIC:
POSITIVE IMPACTS

- Meeting the demand for a reliable and sufficient supply of water in the Kurland area, to not only support the current supply but to also support future development, such as housing, of which there is a significant backlog.
- Reducing the strain on the existing infrastructure.
- Local labour will be sourced from the local communities, particularly those of a historically disadvantaged background, various genders, educational and socio-economic levels. The proposed development will provide:

- Jobs for people with a low education level.
- Provide an opportunity for uplifting and education through the adoption of new skills and also economical upliftment through earning a salary.
- Boosting of the local economy by creating jobs, paying salaries, and using locally sourced goods, services, and labour.
- Creating social stability by providing jobs which not only give a person a sense of self-worth but also an opportunity to provide for their family

- Making Kurland a more desirable location to settle down, as this will boost service availability in this industry.
- Locating the pipeline outside of the old and new N2 SANRAL road reserve, indicating that this infrastructure will not impact upon the future development of a national road, and vice versa.

NEGATIVE IMPACTS

- Temporary, such as noise, dust, traffic and visual impacts from construction activities.

ENVIRONMENTAL IMPACTS
POSITIVE IMPACTS

- The proposal has been found acceptable from an aquatic, agricultural, animal species and heritage perspective.
- With the appropriate mitigation the proposal can be found acceptable from a botanical perspective.
- Opportunity for alien invasive clearance.
- Once reinstated the land cover can be utilized for other land uses, and the ground cover can be rehabilitated.
- Opportunity to implement an EMPr that can be enforced during construction phase and operational phase and supports the implementation and compliance with multiple legislation.
- Opportunity for on-going monitoring.

NEGATIVE IMPACTS

- Temporary disturbance to vegetation and fauna, however can be controlled and managed.
- Temporary nuisances.

As per the findings from environmental specialist input it has been established that the **proposed development is acceptable, along with the recommended mitigation measures, and the EAP is in agreement.**

1.2.	Provide a map that that superimposes the preferred activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers. (Attach map to this BAR as Appendix B2)

See attached as per Appendix B2.1 (Aquatic Features) and the Appendix B2.2 (Botanical/Terrestrial Sensitivity).

1.3.	Provide a summary of the positive and negative impacts and risks that the proposed activity or development and alternatives will have on the environment and community.

PRE-CONSTRUCTION		
	PREFERRED ALTERNATIVE 1: LAYOUT	
IMPACT	IMPACT SIGNIFICANCE BEFORE	IMPACT SIGNIFICANCE AFTER

	MITIGATION	MITIGATION
LEGISLATION COMPLIANCE AND PLANNING	Medium	Low
SITE ESTABLISHMENT AND PRE-CONSTRUCTION ACTIVITIES	Medium	Low
CONSTRUCTION		
IMPACT	PREFERRED ALTERNATIVE 1: LAYOUT	
	IMPACT SIGNIFICANCE BEFORE MITIGATION	IMPACT SIGNIFICANCE AFTER MITIGATION
EROSION, EARTHWORKS AND LAND CLEARANCE	Medium	Low
LOSS OF VEGETATION AND DISRUPTION TO ECOLOGICAL PROCESSES: FYNBOS & FOREST VEGETATION	Medium - High	Medium - Low
DISTURBANCE AND DISPLACEMENT OF FAUNAL HABITAT AND FAUNAL SPECIES OF CONSERVATION CONCERN	Medium	Low
AQUATIC IMPACTS	Medium - High	Low
SOCIAL IMPACT: VISUAL	Low - Medium	Low
SOCIO-ECONOMIC IMPACTS – CREATION OF MULTIPLE JOB OPPORTUNITIES & CAPITAL EXPENDITURE	High (+)	
SOCIAL IMPACT: TRAFFIC & ACCESS	Low - Medium (-)	Low
SECURITY AND VANDALISM	Low - Medium (-)	Low
OPERATIONAL PHASE		
	PREFERRED ALTERNATIVE 1: LAYOUT	
IMPACT	IMPACT SIGNIFICANCE BEFORE MITIGATION	IMPACT SIGNIFICANCE BEFORE MITIGATION
AQUATIC IMPACTS: WATER QUALITY AND IMPEDANCE OF FLOW	Low - Medium	Low
ALIEN INVASIVE SPECIES CLEARANCE AND REHABILIATION	Low - Medium	Low
SOCIO-ECONOMIC IMPACTS: BOOSTING LOCAL REVENUE AND LOCAL ECONOMY	Low +	

	SOCIO-ECONOMIC IMPACTS: PROVISION UPGRADED SERVICES AND INFRASTRUCTURE	**High (+)**
	SOCIAL IMPACT: VISUAL	**Low (-)**
	CLIMATE CHANGE CONSIDERATIONS	

2. Recommendation of the Environmental Assessment Practitioner ("EAP")

2.1.	Provide Impact management outcomes (based on the assessment and where applicable, specialist assessments) for the proposed activity or development for inclusion in the EMPr

Objective 1: Ensure watercourse disturbance and impact on the features, fauna and habitat are temporary.

Impacts to Avoid:

- Contamination of a water resource.
- Additional and uncontrolled impacts to the crossings.
- Change to water quality.
- Downstream impacts of a negative nature.

Impact Management Actions:

- Comply with all recommendations as per the aquatic specialist input as detailed in the EMPr.
- Ensure all works are monitored on site.
- Ensure that all works are within the approved scope and as per the conditions of any relevant license/permit.
- Ensure all works are undertaken during the dry seasons, where possible.
- Ensure the Contractors method statement is acceptable from an Environmental perspective, and ensure that it is implemented accordingly.

Objective 2: Ensure disturbance to the Terrestrial Biodiversity, habitats, processes and fauna are temporary and mitigated as significantly as possible.

Impacts to Avoid:

- Loss of terrestrial biodiversity habitat, processes or fauna.
- Permanent alteration of the above.
- Mature forest vegetation lost.
- Harm to fauna.
- Loss of indigenous SCC without an associated permit.
- Non-compliance with conditions of the permit/licenses relevant to activities.

Impact Management Actions:

- Pre-Construction:
  - Ensure that funding is allocated for all recommended mitigation measures and rehabilitation.
  - Ensure that the construction programme makes allowances for these measures.
  - Ensure that the Contractor is fully aware of his duties in terms of the EMPr and all relevant licenses/approvals/permits.
  - Ensure that construction is undertaken timeously.
- Construction

- Ensure that any relevant permit/authorization required are obtained from the relevant authority.
- Ensure that the smallest working corridor is utilized where possible (max =20m's; within the forest vegetation max =3m's width).
- Ensure that the working corridor is sturdy and prohibits unauthorized access of humans and fauna.
- Ensure all relevant measures as per the specialist input, as detailed in the EMPr are implemented.
- Ensure that search and rescue is undertaken prior to clearance, by an appropriately qualified specialist.
- Ensure that rehabilitation commences immediately after backfilling.

- Operational Phase
  - Ensure rehabilitation is successful.
  - Implement weed management for a minimum of 2 years along the route.
  - Ensure that the pipeline and all infrastructure is maintained as required, and is monitored.

2.2.	Provide a description of any aspects that were conditional to the findings of the assessment either by the EAP or specialist that must be included as conditions of the authorisation.

- All specialist mitigation measures must be implemented in order to sufficiently reduce the impacts identified.
- An Environmental Control Officer must be appointed to monitor the compliance and implementation of the Environmental Management Programme, mitigation measures and the Environmental Authorization conditions.
- It is highly recommended that an Environmental Site Officer, be appointed as a part of the Contractors team, to ensure that the environmental aspect is implemented and managed efficiently, on a daily basis.
- The Applicant is to ensure that all relevant permits/license etc. are in place prior to commencement of construction activities, this includes, but is not limited to:
  - Registration of the final servitude, prior to commencement of any clearance activities.
  - Water Use License approval.
- Implement all management plans as recommended by the Specialist and EAP, including but not limited to:
  - Approved Environmental Management Programme.
  - Rehabilitation Plan.
  - Site Preparation and Vegetation Clearing Plan/Search and Rescue Plan.
  - Emergency Preparedness Plan.

2.3.	Provide a reasoned opinion as to whether the proposed activity or development should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be included in the authorisation.

The proposed development should be authorised for the following reasons:

While it is acknowledged that the botanical and aquatic specialist have noted that the preferred alternative is Alternative 2 in terms of the 200mm Rising Main (North of the N2). SANRAL will not permit development within the new and old N2 road reserve. Moving the pipeline beyond the new road reserve will result in significantly higher impacts for both the aquatic and botanical aspects.

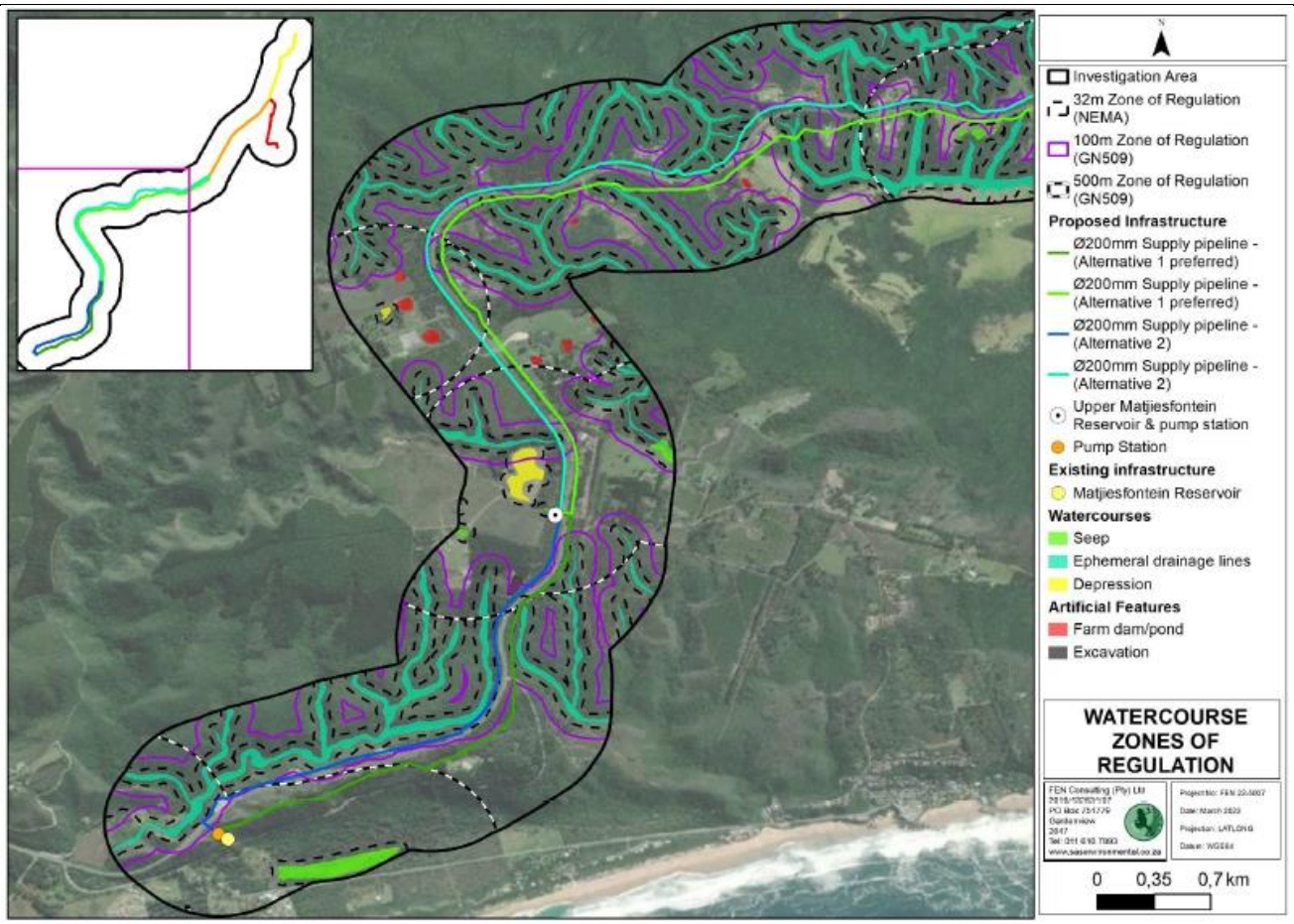


Figure 55: Aquatic features surrounding the proposed 200mm Rising Main Alternatives.

As seen in Figure 55, multiple ephemeral drainage features and regulatory zones dominate the north of the N2, moving the pipeline further into the northern portion of the N2 would only result in additional impacts, that could potentially be more significant than those to the South.

Forest Vegetation:

Although it recognized that forest vegetation is highly sensitive, measures have been integrated into the BAR to significantly reduce the impacts on the forest environment, as due to the new SANRAL road reserve the option of moving the pipeline into the road reserve is not feasible or possible. These measures include:

- Reducing the working corridor to 3m wide.
- Specialist appointed to undertake search and rescue must assess this corridor and identify mature tree species that must be avoided.
- The engineer is to confirm this working corridor.
- The ECO/Specialist is to inspect the route and ensure that all mature tree species are identified and avoided.
- The ECO/Specialist is to apply for the relevant permit to remove specific immature tree species.

The EAP is of the opinion that the permit should be approved by the Department of Forestry. In terms of the National Forests Act 84 of 1998 with Amendments, Section (3)(a) of the National Forests Act stipulates that '*natural forests must not be destroyed save in exceptional circumstances where, in the opinion of the Minister, a proposed new land use is preferable in terms of its economic, social or environmental benefits*'.

The proposed development is intended to accommodate for the upgrades to the bulk water infrastructure in the Kurland area, from the following perspective the proposal is essential:

- Socio-economic
  - The proposed development will support the supply of freshwater to the Kurland area. Access to sufficient water is recognized as a basic need, in the South African Constitution and as per the Bill of rights.
  - This need is supported in the Water Services Act 108 of 1997, is intended to provide for the right to basic water supply and basic sanitation services. This Act recognises that the right of access to basic water supply and to basic sanitation services is necessary to ensure sufficient water and an environment that is not harmful to health or wellbeing of people and animals.
  - The municipality has a responsibility to ensure that essential services and their relevant capacity and infrastructure is provided and maintained. Landowners pay taxes and rates of which a portion is dedicated to ensure that they have access to water as a basic human rights.
  - In liaising with residents it has become clear that the improvement of the existing water supply is a need.
  - By upgrading the bulk water supply, the municipality is able to meet the projected KPI's as set out in their legislation and policies, as required of them.
  - By supplying this essential service in an acceptable capacity, the municipality is able to support the existing Kurland residents, businesses, and local economy, as well as an accommodate other key developments including future housing developments, addressing the existing backlogs in the area.
  - The proposed development intends to accommodate a 200mm pipeline, which is significantly small for a bulk water pipeline.

- Environmental
  - The design accommodates for a 200mm UPVC pipeline, which is significantly smaller than general bulk water pipelines. The benefits of this includes:
    - Smaller final servitude required to be maintained.
    - Pipelines can be carried by carried onto site by labour if necessary.
    - UPVC has multiple benefits, including no risk of contamination.
  - Through the forest vegetation, the following procedure will be implemented:
    - Only a 3m wide corridor will be utilized.
    - Labour will be utilized to establish the trench, transport and lay the pipe.
    - An appropriately experienced specialist responsible for the search and rescue along the rest of the route, will inspect the proposed route and identify mature tree species to avoid.
    - All clearance activity will be inline with the requirements detailed in the EMPr, and will be monitored by the ECO.

Overall, the proposal should be approved for the following reasons:

Environmental reasons:

- The aquatic specialist has confirmed that the aquatic impacts are low after mitigation.
- The agricultural and animal species specialists have confirmed that the sensitivity significance is low, with minimal mitigation required.
- The botanical specialist has confirmed that the terrestrial biodiversity impacts are low after mitigation, however in the forest environment this is deemed medium significance.
- Opportunity for clearance of alien invasive vegetation.
- The pipelines, unlike most bulk water pipelines, are relatively small in diameter, and can be

transported and moved by hand (uPVC), which provides the opportunity for more manual labour where the disturbance footprint can be reduced, as compared to heavy machinery being required consistently.

Socio-economic reasons:

- Utilization of existing infrastructure.
- The proponent, the local municipality, intends to fulfil its responsibilities by improving service infrastructure which in turn will support other essential developments such as housing, etc. This will have a positive impact on not just the Kurland area and infrastructure, but also the Kurland residents, current and future, thereby imp-roving the local economy as Kurland becomes more attractive for business and residential purposes.
- Multiple, temporary job opportunities will be established, during construction.

2.4.	Provide a description of any assumptions, uncertainties and gaps in knowledge that relate to the assessment and mitigation measures proposed.

Freshwater Assessment

The following assumptions and limitations are applicable to this report:

- This field assessment was undertaken in March 2022, during the autumn season3 when baseflows in perennial riparian systems are expected to be low, and likely absent in seasonal and ephemeral river systems, indicating that fieldwork data collection may be limited, which ultimately limits the confidence of PES, EIS and ecological services assessments;
- The identification of ephemeral drainage lines was particularly challenging considering the density of the forest typical of the South Eastern Coastal Belt Ecoregion and relied on the identification of valleys and changes in vegetation (increases in the density of trees);
- Ground-truthing and delineation of all watercourses was done based on a single site visit undertaken on the 14th and 15th of March 2022. The watercourses identified within the investigation area were mainly observed from the N2 national road due to site access and terrain mobility constraints. GPS co-ordinates were obtained to verify the watercourses within the road reserve with the remaining areas being desktop delineated using various desktop methods including the use of topographic maps, 5 m contour lines, historical and current digital satellite imagery and aerial photography. This is deemed sufficient to inform whether any watercourses or their regulatory areas would be traversed by the proposed bulk water pipeline
- Global Positioning System (GPS) technology is inherently somewhat inaccurate and some inaccuracies due to the use of handheld GPS instrumentation may occur, however, the delineations as provided in this report are deemed sufficiently accurate to fulfil the authorisation requirements as well as implementation of the mitigation measures provided;
- Watercourses and terrestrial zones create transitional areas where an ecotone is formed as vegetation species change from terrestrial to obligate/facultative species. Within this transition zone, some variation of opinion on the watercourse boundaries may occur. However, if the DWAF (2008) method is followed, all assessors should get largely similar results; and
- With ecology being dynamic and complex, certain aspects (some of which may be important) may have been overlooked. However, it is expected that the proposed development activities have been accurately assessed and considered, based on the field observations and consideration of existing studies and monitoring data in terms of riparian and wetland ecology.

Terrestrial Animal Species Specialist Assessment

- It is assumed that all third-party information used (e.g. GIS data, satellite imagery and species datasets) is correct at the time of generating this report;
- The survey was restricted to a single day in a single season (autumn), but it is not considered necessary to perform any additional season surveys;
- Some identified habitats could not be photographed due to road construction/maintenance, but it is not considered necessary as satellite imagery and SANLC data conforms with what was observed on site; and
- The Site Sensitivity Verification report applies the precautionary principle and probability of occurrence, assuming that all terrestrial animal SCCs recorded in the area (or those with overlapping ranges) may occur in the proposed developmental footprint.

Agricultural Compliance Statement

- In completing this statement, no assumptions have been made and there are no uncertainties or gaps in knowledge or data that are relevant to it.

Terrestrial Biodiversity Assessment

The findings and recommendations of this report may be susceptible to the following uncertainties and limitation:

- No assessment has been made of aquatic processes relating to any wetlands, pans and rivers/seeps and/or estuaries outside of the scope of those having an influence on the terrestrial biodiversity.
- Any botanical surveys based upon a limited sampling time-period, may not reflect the actual species composition of the site due to seasonal variations in flowering times. Additionally, the composition of fire adapted vegetation may vary depending on level of maturity or time since last burn. As far as possible, site collected data has been supplemented with desktop and database-centred distribution data.

2.5.	The period for which the EA is required, the date the activity will be concluded and when the post construction monitoring requirements should be finalised.

- The period for which the EA is required = 10 years.
- The date the activity will be concluded = 5 years.
- When the post construction monitoring requirements should be finalised = 10 years.

3. Water

Since the Western Cape is a water scarce area explain what measures will be implemented to avoid the use of potable water during the development and operational phase and what measures will be implemented to reduce your water demand, save water and measures to reuse or recycle water.
Development, Design and Construction: • Labour will be encouraged to utilize buckets of water to clean tools and machinery, rather than running water, to preserve water. • Rainwater capturing should be encouraged on site. Operational Phase: No water usage during operations. The project aims to provide potable water to the community…. Check for pipeline leaks etc

4. Waste

Explain what measures have been taken to reduce, reuse or recycle waste.

The EMPr has encouraged waste management through the various phases of the project.

Construction Phase:

- An integrated waste management approach (AVOID first, then REDUCE, then REUSE, then RECYCLE, then DISPOSAL) must be adopted.
- Adequate waste receptacles, bins and skips should be available for the collection and removal of waste.
- Individual recycling bins for the various categories (paper, glass, plastic, etc.) must be provided, labelled and have a designated area on site, close to access points (for easy removal), away from any natural areas, and should have appropriately weighted lids, to prevent the wind from toppling the bins, resulting in waste dispersal.
- These bins must be emptied as often as possible and dropped off at a collection point for recycling, a waste slip is to be obtained as proof of this, and this must be filed in the Environmental File.
- Infographics and educational notices to create awareness around sustainable waste management should be provided at the site camp.
- Environmental awareness training will be conducted for all site workers to create awareness.
- Any solid waste intended for disposal must be disposed of at a landfill site, licensed in terms of section 20 of the Environment Conservation Act, 1989 (Act No. 73 of 1989) or the National Environmental Management: Waste Act (Act No. 59 of 2008).

5. Energy Efficiency

8.1.	Explain what design measures have been taken to ensure that the development proposal will be energy efficient.

Construction Phase:

- Infographics and educational notices will be established on site to create awareness encourage energy efficiency.

Operational Phase:

- Where opportunities arise to reduce energy demand, this should be explored, ie alternative energy supply to power pump stations.
- Pump stations will have back-up generators in the event of loss of power supply.

SECTION K: DECLARATIONS

DECLARATION OF THE APPLICANT

Note: Duplicate this section where there is more than one Applicant.

I, VICTOR W. FELTON, ID number 6703069520871 in my personal capacity or duly authorised thereto hereby declare/affirm that all the information submitted or to be submitted as part of this application form is true and correct, and that:

- I am fully aware of my responsibilities in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA"), the Environmental Impact Assessment ("EIA") Regulations, and any relevant Specific Environmental Management Act and that failure to comply with these requirements may constitute an offence in terms of relevant environmental legislation;
- I am aware of my general duty of care in terms of Section 28 of the NEMA;

- I am aware that it is an offence in terms of Section 24F of the NEMA should I commence with a listed activity prior to obtaining an Environmental Authorisation;

- I appointed the Environmental Assessment Practitioner ("EAP") (if not exempted from this requirement) which:
  - meets all the requirements in terms of Regulation 13 of the NEMA EIA Regulations; or
  - meets all the requirements other than the requirement to be independent in terms of Regulation 13 of the NEMA EIA Regulations, but a review EAP has been appointed who does meet all the requirements of Regulation 13 of the NEMA EIA Regulations;

- I will provide the EAP and any specialist, where applicable, and the Competent Authority with access to all information at my disposal that is relevant to the application;

- I will be responsible for the costs incurred in complying with the NEMA EIA Regulations and other environmental legislation including but not limited to –
  - costs incurred for the appointment of the EAP or any legitimately person contracted by the EAP;
  - costs in respect of any fee prescribed by the Minister or MEC in respect of the NEMA EIA Regulations;
  - Legitimate costs in respect of specialist(s) reviews; and
  - the provision of security to ensure compliance with applicable management and mitigation measures;

- I am responsible for complying with conditions that may be attached to any decision(s) issued by the Competent Authority, hereby indemnify, the government of the Republic, the Competent Authority and all its officers, agents and employees, from any liability arising out of the content of any report, any procedure or any action for which I or the EAP is responsible in terms of the NEMA EIA Regulations and any Specific Environmental Management Act.

Note: If acting in a representative capacity, a certified copy of the resolution or power of attorney must be attached.

VWFelton 15/11/2022

Signature of the Applicant: Date:

BITOU LOCAL MUNICIPALITY

Name of company (if applicable):

DECLARATION OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER ("EAP")

I **Ameesha Sanker** , EAPASA Registration number **4372** as the appointed EAP hereby declare/affirm the correctness of the:

- Information provided in this BAR and any other documents/reports submitted in support of this BAR;
- The inclusion of comments and inputs from stakeholders and I&APs;
- The inclusion of inputs and recommendations from the specialist reports where relevant; and
- Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties, and that:
- In terms of the general requirement to be independent:
  - other than fair remuneration for work performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity; or
  - am not independent, but another EAP that meets the general requirements set out in Regulation 13 of NEMA EIA Regulations has been appointed to review my work (Note: a declaration by the review EAP must be submitted);
- In terms of the remainder of the general requirements for an EAP, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;
- I have disclosed, to the Applicant, the specialist (if any), the Competent Authority and registered interested and affected parties, all material information that have or may have the potential to influence the decision of the Competent Authority or the objectivity of any report, plan or document prepared or to be prepared as part of this application;
- I have ensured that information containing all relevant facts in respect of the application was distributed or was made available to registered interested and affected parties and that participation will be facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments;
- I have ensured that the comments of all interested and affected parties were considered, recorded, responded to and submitted to the Competent Authority in respect of this application;
- I have ensured the inclusion of inputs and recommendations from the specialist reports in respect of the application, where relevant;
- I have kept a register of all interested and affected parties that participated in the public participation process; and
- I am aware that a false declaration is an offence in terms of Regulation 48 of the NEMA EIA Regulations;

14th November 2022

Signature of the EAP: Date:

Sharples Environmental Services.cc

Name of company (if applicable):